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JOURNAL *of* EDUCATIONAL RESEARCH

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EMPIRICALLY DETERMINED GRADE NORMS AS A FACTOR IN THE EDUCATIONAL MALADJUSTMENT OF THE "AVERAGE" CHILD

Part I. A Critical Evaluation of Actual Grade Placements of Children in the 90-109 I. Q. Group.

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INTRODUCTION

The problem.—The purpose of this study is to investigate the validity of present grade norms as measures of achievement for the "average" child. It has been generally recognized that grade norms have certain inherent weaknesses due to the variables of age, social environment, etc. Hence, grade norms on even the best standardized tests always have to be applied critically in any given school. A somewhat different question now arises. Are norms, which have been based on grades as these are at present composed, valid criteria for judging the achievement of children who are in the 90-109 I. Q. group? Or are even norms that are based on age much better criteria so long as they are determined under existing conditions of grading? The question is not whether the group that we have chosen for study is representative, but whether the group on which the norms are based is undistorted. The child of average mentality has been made the subject of the investigation because it may be assumed that the "average" child should make regular progress through the grades. If present achievement norms handicap the "average" child so that he is not able to progress at the rate of a grade a year, then the present norms are helping to perpetuate the very thing that educators are trying to eliminate, namely, non-promotion of the child of average mental ability. Briefly, our problem is to determine whether there is entrenched in the present type of grade norm a hidden factor that operates to continue an actual retardation of the child in the 90-109 I. Q. group.

History of the problem.—The literature dealing with the validity of grade norms as measures of achievement for the "average" child appears most meagre. In fact, so far as we have found, only one attempt has been made to show that present achievement norms are so intimately dependent upon other factors than grade placements that these norms actually should not be applied to the child of average mental capacity. We refer to the work of J. R. Crawford, reported in the *University of Iowa Studies in Education*[1] and favorably treated in Greene and Jorgensen's text.[2] The significance of this study lies in the finding that "norms based on the total grade are affected by age and progress factors to the extent of being significantly higher than if only the group which is regular in these factors is used." By "regular" group was meant pupils in 6-B who on April first had chronological ages and mental ages of 139-150 months and who had a progress rate of 1.00. It was further found in this study that the I. Q. factor covered the effect of the progress factor, thereby making it possible to set up norms on the basis of C. A. and I. Q. This resulted in three norms for each year of chronological age: (1) for those below 90 I. Q., (2) for those 90-110, and (3) for those above 110.

The inimical effect of norms that are based on the achievement of the whole grade is forcefully set forth in a report by Cheyney and Boyer.[3] According to their investigations "a pupil with an intelligence quotient of 90 has but one chance in ten of escaping retardation of one or more terms from grades 1-A to 8-B." Wherefore they argue that standards of achievement per grade should be replaced by achievement standards given in terms of I. Q. and per year of school life.

St. John's investigation of the effect of intelligence on educational achievement[4] is especially pertinent, though the viewpoint is less related. He finds that of 256 pupils in the 90-99 I.Q. group, Grades I-V, 58 percent of the boys and 48 percent of the girls had repeated grades, while 334 pupils in the 100-109 I. Q. group, 24 percent of the boys and 19 percent of the girls had repeated grades.[5] Further, the probability of marks,

[1] Crawford, J. R. "Age and Progress Factors in Test Norms," *University of Iowa Studies in Education*, IX, No. 4, 1934.

[2] Greene, H. A., and Jorgensen, A. N. *The Use and Interpretation of Elementary School Tests* (New York: Longmans, Green and Company, 1935), p. 219.

[3] Cheyney, W. W., and Boyer, P. A. "A Proposed Plan for the Organization of Education in Illinois," *Elementary School Journal*, XXXIII (May, 1933), pp. 647-51.

[4] St. John, C. W. "Educational Achievement in Relation to Intelligence," *Harvard Studies in Education*, No. 15, Harvard University, 1930.

[5] St. John, C. W. *op. cit.*, p. 129, Table 24, (Data given here are corrected to exclude those sent to special classes, about one percent in the 90-99 I. Q. group).

which was based on sigma values, showed that in the 90-99 I. Q. group 57 percent of the boys and 45 percent of the girls would receive "D" or "F," i. e., were below the average-achievement group, while in the 100-109 I. Q. group 31 percent of the boys and 20 percent of the girls would receive "D" or "F."[6]

Though the question being considered appears to have received so little attention, the indication is that the achievement norms and standards now in use are not entirely fair to the children of average mental ability.

Present approach to the problem.—Whether achievement norms are given in grade units or age units, they are in either case based on the results of testing graded pupils. The effect of this inevitable factor of grade is that only when the grade placements of the children are correct can valid achievement norms be obtained. If the actual grade placements of any group are lower than they should be, achievement norms standardized on that group will be too difficult, and if the grade placements of a group are higher than they should be, achievement norms based on the performance of that group will be too easy. Further, only when the grade placements of any group are correct can the normal distribution of achievement in that group be made the basis of promotion, for if the grade placements are too low then conformance to the normal curve will fail too many, and if the grade placements are too high conformance to the normal curve will unduly accelerate the group. Because grade placement appears to be a pivotal factor, whether standardized norms are used or not, the remainder of the present paper will endeavor to evaluate the soundness of the present grade placement of the "average" child and in this way make an attack on the problem of achievement norms, which are our basic concern. Since achievement norms are generally referred to as grade norms when based on grade (age norms when based on age), the reader is warned against confusing the term *grade placement norm* with *grade norm*. Grade placement norms show what *grade* an individual or given group should be in according to chronological age or mental age when judged by previous reliable findings. Grade norms show what *achievement* an individual or given group should attain according to grade when judged by previous reliable findings.

COLLECTION AND TREATMENT OF DATA

The data on the grade placements of children in the 90-109 I. Q. group represent 4831 cases in 31 schools in Los Angeles as of February, 1935.

[6] St. John, C. W. *op. cit.*, p. 121, Table 19. Data represent only those at age for grade, i. e., 6 to 8 years for Grade I, 7 to 9 years for Grade II, etc.

Information was obtained on chronological age, actual grade, and I. Q. as determined by national standardized group intelligence tests. Chronological ages and mental ages were then turned into chronological grade placements and mental age grade placements on the basis of age-grade norms obtained in a city-wide survey, made in 1927 and in use at the present time. These derived grade placements, which are based on the age-grade norms of 1927, are herein referred to as chronological and mental age grade placement norms.

DISCUSSION OF RESULTS

How does the grade placement of the "average" child compare with the grade placement norms?—Since the pupils being studied are "average" children, it is to be expected that their actual grade placements will not differ greatly from the grade placement norms on the basis of either chronological age or mental age. In general, this was found to be the case. The actual grade placements of these children averaged 3.93, while the mean chronological grade placement norm was 4.03 and the mean mental age grade placement norm was 4.00 (Table I). This means that according to their chronological age these children should be placed .10 of a grade higher, if judged by present chronological grade placement norms, and according to their mental age they should be placed .07 of a grade higher, judged by present mental age grade placement norms.

Are the present norms valid criteria?—Approximation to existing grade placement norms is only maintaining the *status quo*, and it cannot be said that this is good or bad until the composition of the grades used in determining the grade placement norms is carefully considered. In general, it may be said that the grades on which the present norms were based were composed of the following classes of pupils: (1) repeaters of the present grade, (2) repeaters of previous grades, (3) those who first entered the grades at an age six months or more older than the entrance age permitted by law and have made regular progress, (4) a few who also entered later than they might have and have had one or more double promotions, (5) a few who entered within the first six months permitted by law and have had double promotions, and (6) those who entered the grades within the first six months permitted by law and have not had any failures or double promotions. We shall consider briefly some effects that the present proportions of these classes of pupils have on grade placement norms.

Consider, first, the effect of the repeaters. A 90 percent yearly promotion rate would probably be agreed to as fair general educational practice, yet Ayres[7] has shown that, assuming none die and none drop out, 1000 entering each year results in 480 not failing, 520 having failed, and an aggregate of 690 failures among the 1000 fourteen-year olds. This indicates that the present grade placement norms are largely based on failures. Yet these norms are being used to measure the grade placements of children of average mental ability, who are supposed to progress through the grades without failures. To be more specific, the presence of repeaters raises the chronological age for grade, with the result that chronological grade placement norms are lower than they would be without the repeaters.

The effect of double-promotion might be to lower the mental age for grade, but since the number of double-promotions is greatly outweighed by the number of failures no such averaging effect occurs. A survey made by the U. S. Department of the Interior[8] shows that the skips amount to only 15 percent of the failures. The San Francisco school report for the fall term, 1934[9], gives 20 percent. In general, the accepted procedure is to make few double promotions. This practice, regardless of whether good or bad in itself, results in both a higher mental age and also a higher chronological age for grade than would otherwise obtain, and the grade placement norms are consequently lower than they would be if the failures did not so out-weigh the double promotions.

Entrance age is another variable that affects the present composition of grades and hence the grade placement norms. Mort and Featherstone have found from a nation-wide survey of city schools[10] that 53 percent of pupils in schools using semi-annual promotion enter Grade I for the first time in the 5 years, 9 months-6 years, 3 months period, and 66 percent of pupils in schools using annual promotion enter Grade I for the first time in the 5 years, 9 months-6 years, 9 months period. It appears

[7] Ayres, Leonard P. *Laggards in Our Schools* (New York: Russell Sage Foundation, 1909), p. 147.

[8] Blose, D. T., and Covert, T. *An Age-Grade Study of 7,632 Elementary Pupils in 45 Consolidated Schools*, Pamphlet No. 8 (Washington: Office of Education, Department of the Interior, 1930), p. 9.

[9] Lee, Edwin A., and others. *Promotion Report for San Francisco Elementary Schools Fall Term, 1934*, San Francisco Public Schools Bulletin No. 69 (San Francisco: Bureau of Research, San Francisco Public Schools, 1935), p. 6.

[10] Mort, P. R., and Featherstone, W. B. *Entrance and Promotion Practices in City School Systems; Standards and Accounting Procedures* (New York: Bureau of Publications, Teachers College, Columbia University, 1932), pp. 9-10.

from this that more than one-half of the pupils entering Grade I for the first time do so at their earliest opportunity. But what is the effect of those who enter later? Obviously the chronological, and most likely the mental, age averages of the grade are raised. This means that the grade placement norms show a lower grade than they would if there were not a large proportion of pupils (34 percent-47 percent) entering at a date six months or more later than they first would have been permitted to enter according to school entrance laws.

There are, then, three factors that definitely raise the chronological and mental age averages for grade: (1) the cumulative effect of repetitions, (2) relative infrequency of double promotions, and (3) entrance into Grade I at an age six months or more older than that which would have been permitted by law. The result is that the chronological and mental-age grade placement norms are too low to be used as a valid standard for the "average" child who enters within the first six months of age allowed by school entrance laws.

On what basis should a grade placement standard rest?—Making use of Mort and Featherstone's findings we may tentatively assume that approximately one-half of pupils entering Grade I for the first time do so within the first six months of age allowed in semi-annual promotion school systems, or within the first twelve months of age allowed in the annual promotion school systems. That these children should set the chronological and mental age norms for their class would perhaps not be argued. But suppose that the number entering within these periods be less than 50 percent? It is our contention that this should not affect the grade placement standard, and this whether or not the period in question includes the mode, which it most likely will.

Our argument is this: *if an "average" child enters the first grade as soon as he may in conformance with school entrance laws, his normal grade placement henceforth should be expressed in years since entrance date.* Now, whether many or few pupils enter with him in like status, the normal age for the class is thereby set. Further, however many, born during the same period as the first group, may enter in the next semester or year, they are, then and henceforth, over-age for their class, regardless of whether they entered within the compulsory age limit and regardless of whether they make regular or slow progress. In short, the point of reference in grade placement studies should be entrance age, preferably the first six months allowed by law. In accordance with this principal

the "standard" grade placement, which our group of average children should hold, were computed. (Table I). The difference between the "standard" and the actual grade placement averages —.53 grades, which means that the actual grade placement averages one full term below the "standard" grade placement.

The argument favoring entrance age as the point of reference in grade placement studies may be better appreciated if we consider the case of a single "average" child. Suppose he enters at the mid-point of the first six months allowed by law, i. e., at 6-0, but the accepted age span for entering B-1 is 5-9 to 6-9, median 6-3. Suppose, further, that this particular child makes regular progress, but that the average rate of progress is 1.11 years per grade (90 percent yearly promotion rate). By the end of the eighth grade the mean age of his class is mean entrance age, say 6-3, plus 8 x 1.11, or 15.13 years, which approximates 15 years, 2 months. But the age of this child who entered at 6-0 and made no failures is only 14-0. In other words, before he gets through the elementary grades he has to compete with pupils who are on an average one and one-sixth years older chronologically than he. Again, suppose that this "average" child has an intelligence quotient of only 95, but the average for the grade is

TABLE I

GRADE PLACEMENTS OF 4831 "AVERAGE" CHILDREN ARRANGED BY ACTUAL GRADE

Grade Steps	Av. Act. Grade	Av. Chr. Gr. Pl.	Av. M.A. Gr. Pl.	Av. Std. Gr. Pl.	Diff. between Act. and Av. Chr. Gr. Pl.	Diff. between Act. and Av. M.A. Gr. Pl.	Diff. between Act. and Av. Std. Gr. Pl.	Av. A.A.	Av. I.Q.	N
1.0-1.4	1.21	1.42	1.42	1.71	—.21	—.21	—.50	80.5	100.2	320
1.5-1.9	1.79	1.95	1.94	2.27	—.23	—.22	—.55	87.2	100.0	333
2.0-2.4	2.23	2.38	2.39	2.73	—.15	—.16	—.50	92.8	100.2	417
2.5-2.9	2.72	2.86	2.85	3.26	—.14	—.13	—.54	99.1	99.8	433
3.0-3.4	3.21	3.32	3.28	3.74	—.11	—.07	—.53	104.9	99.7	409
3.5-3.9	3.70	3.88	3.82	4.31	—.18	—.12	—.61	111.7	99.5	408
4.0-4.4	4.21	4.32	4.25	4.77	—.11	—.04	—.56	117.2	99.4	464
4.5-4.9	4.72	4.78	4.67	5.25	—.06	+.05	—.53	123.0	99.1	364
5.0-5.4	5.23	5.20	5.13	5.71	+.03	+.10	—.48	128.5	99.4	423
5.5-5.9	5.73	5.75	5.75	6.31	—.02	—.02	—.58	135.7	100.0	303
6.0-6.4	6.24	6.21	6.14	6.79	+.03	+.10	—.55	141.5	100.0	375
6.5-6.9	6.68	6.63	6.62	7.25	+.05	+.06	—.57	147.0	100.0	284
7.0-7.4	7.19	7.15	7.32	7.77	+.04	+.13	—.58	153.2	100.2	60
7.5-7.9	7.63	7.76	7.61	8.29	—.13	+.02	—.66	159.5	99.0	39
8.0-8.4	8.16	8.33	7.98	8.80	—.17	+.18	—.64	165.6	97.5	24
8.5-8.9	8.66	8.55	8.50	9.03	+.11	+.16	—.37	168.4	99.8	29
Gd. Av.	3.93	4.03	4.00	4.46	—.10	—.07	—.53	113.5	99.6	

105. This means that by the end of the eighth grade his mental age is 13-4, while that of the class averages 15-11. Of course, this is a hypothetical case which would rarely occur, since the chances of making regular progress are undoubtedly very poor for any child of only average ability.

Yet the basic assumption to which all would probably agree is that the "average" child should make regular progress. But if the chronological and mental ages for grade are too high and if the grade placement norms are consequently too low, the achievement norms must represent attainments which are hardly possible for the "average" child to achieve at the rate of a grade a year. Each term that he succeeds in making the goal, which has been set for him by children older chronologically and mentally than he, he is confronted by one increasingly more difficult for his capacity. In short, it appears that achievement norms based on the present composition of grades cannot possibly be called valid measures of achievement for the child in the 90-109 I. Q. group. Under the operation of these achievement norms the child of only average mental ability must continue to face failure. Retardation will be his lot and his grade placement will be lower than it should be.

What the grade placement of the "average" child might reasonably be expected to be cannot be settled with our present data. But if we control the variables that seemingly should not be left operating, namely, many non-promotions, few double promotions, and late entrances, in other words, if we give fair consideration to the group of "average" children who enter B-1 as soon as they may in conformance with the entrance age law, we seem to have but one basis for a "standard" grade placement. This is the mid-point of the first six months allowed by law[11] plus regular progress of one grade per year. If the entrance age permitted by law in a semi-annual promotion system is 5-9, then normal entrance age to B-1 would be 5-9 to 6-3 and regular progress of one year to a grade would give the "standard" age for any other grade.

With achievement norms worked out on the basis of grade placements such as are shown by the present grade placement norms, it becomes quite evident that the "average" child, the child of 90-109 I. Q. cannot possibly achieve this "standard" grade placement. Either the

[11] Since the time between the beginning of the two terms is not the same, it would be necessary to base the computation of ages on dates six months apart, as September 1 and March 1. These dates have already been used in some studies. Mort and Featherstone, *Op. cit.*

assumption that the child of average mental capacity should make regular progress must be dropped, in theory as well as in practice, or achievement norms must be based on the ability of "average" children who enter B-1 at an age not more than six months older than the first permitted by law. Only when achievement norms represent the attainments of such children, i. e., those having average mental ability and "standard" grade placement, can they be called valid measures of subject mastery for the "average" child.[12]

CONCLUSIONS

1. Data in the present study on the actual grade placements of children in the 90-109 I. Q. group show that the "average" child tends to be placed slightly lower than both the chronological grade placement norm and the mental-age grade placement norm.
2. The chronological grade placement norms and the mental-age grade placement norms themselves are low, since they are based on the operation of factors that unduly raise the chronological and mental age averages for grade.
3. Factors herein considered as operating to raise the chronological and mental age averages for grade are (1) cumulative effect of repetitions, (2) relative infrequency of double promotions, and (3) entrance at an age six months or more older than the youngest age permitted by law.
4. Achievement norms based on the grade placements of pupils who show high chronological and mental ages for grade are too high for the child of average mental ability who enters within the first six months permitted by law.

[12] Since these norms will be too easy for the "average" child who enters later than the first six months allowed by law, he might be able to make a double promotion which would bring him up to his age group.

THE SOCIAL COMPETENCE OF SPECIAL CLASS CHILDREN

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SPECIAL classes in the public schools began with the special education of the deaf. These were soon followed by special classes for mentally gifted children. More recently special classes have been organized for nearly all types of mentally, physically, and socially exceptional children. However, the growth of special classes from 1910 to 1930 for mentally deficient children was so extensive in comparison with other types of special education that the term "special class" has been generally used as synonymous with special classes for the mentally subnormal. In many places these were ungraded classes, used more or less indiscriminately for the educationally backward, the mentally deficient, the incorrigible, and various types of educational misfits.

The advent of the Binet-Simon Scale did much to promote the formation of special classes for the feeble-minded of school age. In fact, the attempt to reserve these classes for mentally deficient children soon led to the systematic organization of other special classes as the various types of educational misfits became more clearly recognized.

The extensive use of the Binet scale in "testing" educationally retarded pupils for admission to special classes resulted in the wide-spread use of Binet I. Q.'s and mental ages alone as standards for admission. Therefore, in spite of early attempts to reserve these special classes for the genuinely feeble-minded, only a few school systems succeeded in doing so. Because of failure to employ comprehensive methods of clinical diagnosis, many intellectually retarded but not mentally deficient[1] children were admitted. Even those schools which did employ competent clinical psychologists found it impracticable to differentiate between the feeble-minded and the intellectually retarded.

*The substance of a dissertation submitted in partial fulfillment of the requirements for the Masters' degree at Rutgers University.

[1] In this paper "mentally deficient" is used in the accepted professional and legal meaning as synonymous with "feeble-minded." Some authorities use "mental deficiency" as a generic term for both feeble-mindedness and intellectual retardation without distinction.

In relation to the educational and social objectives of the public school this is a critical distinction since the feeble-minded child may be expected to live his adult life under supervision, whereas the mentally subnormal but not feeble-minded child may be expected to manage his social affairs "on his own." This difference in anticipated ultimate status requires a difference in educational objectives, and therefore in school practice, for these two types of children.

Under comprehensive clinical psychological examination the feeble-minded child is found to be below normal in practically all respects, mentally, physically, and socially, as well as educationally. The mentally subnormal but not feeble-minded child, on the other hand, (1) reveals his mental subnormality most conspicuously in the Binet-Simon and other verbal types of intelligence tests, (2) shows corresponding deficiency in the verbal school subjects, but (3) is socially adequate except in the direction of educational attainment, and (4) does about as well as the average child on non-verbal intelligence tests. These differences are often clear to special class teachers, who have very little difficulty in distinguishing between the feeble-minded children and the normal children in their classes on the basis of their school experiences with these pupils.

These statements are somewhat dogmatic and may not be subscribed to by others concerned with these problems. Can these generalizations be experimentally verified? In the present paper we are specifically concerned with the measurement of the social competence of children in special classes for the mentally retarded. What is the condition of the pupils in these classes with respect to their social competence in contrast with their Binet intelligence? Is it practicable to distinguish between the feeble-minded and the dull-normal in these classes in this respect?

We may raise a related question, namely, why do some of the feeble-minded go to special classes in the public schools whereas other feeble-minded in apparently the same social circumstances are committed to institutions? Conservative estimates place the number of the feeble-minded in the public schools at two percent of the school population. Most school surveys reveal that more than four times this number of public school children are gravely retarded mentally and educationally, without being mentally deficient.[2] But less than one-twentieth of the two percent rated as feeble-minded reach institutions for the feeble-minded before twenty years of age, even in those states which have the most extensive state in-

[2] These percentages vary greatly from school to school and district to district.

stitutional provision for their care. Is it likely that the social competence of the feeble-minded who are committed to institutions is appreciably less than that of those who attend special classes in the public schools, although of the same degree of deficiency as indicated by mental age?

VINELAND SOCIAL MATURITY SCALE

Name.....Age.....M.A.....Date.....

Descent.....Sex.....Grade.....I.Q.....Born.....

Occupation.....Yrs. exp.....Class.....Res.....

Father's occupation.....Class.....Schooling.....

Mother's occupation.....Class.....Schooling.....

Informant.....Relationship.....Recorder.....

Remarks:

Basal score .....

Additional pts. .....

Total score .....

Age equivalent .....

Social quotient .....

Informant's est. .....

Categories†	*Items*	O-I
C	1.	"Crows"; laughs
S H G	2.	Balances head
S H G	3.	Grasps objects within reach
S	4.	Reaches for familiar persons
S H G	5.	Rolls over
S H G	6.	Reaches for nearby objects
O	7.	Occupies self unattended
S H G	8.	Sits unsupported
S H G	9.	Pulls self upright
C	10.	"Talks"; imitates sounds
S H E	11.	Drinks from cup or glass assisted
L	12.	Moves about on floor
S H G	13.	Grasps with thumb and finger
S	14.	Demands personal attention
S H G	15.	Stands alone
S H E	16.	Does not drool
C	17.	Follows simple instructions

†Key to categorical arrangement of items:
S H G—Self-help general
S H D—Self-help dressing
S H E—Self-help eating
S D—Self-direction
C—Communication
S—Socialization
L—Locomotion
O—Occupation

		I-II
L	18.	Walks about room unattended
O	19.	Marks with pencil or crayon
S H E	20.	Masticates food
S H D	21.	Pulls off socks
O	22.	Transfers objects
S H G	23.	Overcomes simple obstacles
O	24.	Fetches or carries familiar objects
S H E	25.	Drinks from cup or glass unassisted
S H G	26.	Gives up baby carriage
S	27.	Plays with other children
S H E	28.	Eats with spoon
L	29.	Goes about house or yard
S H E	30.	Discriminates edible substances
C	31.	Uses names of familiar objects
L	32.	Walks upstairs unassisted
S H E	33.	Unwraps candy
C	34.	Talks in short sentences
		II-III
S H G	35.	Asks to go to toilet
O	36.	Initiates own play activities
S H D	37.	Removes coat or dress
S H E	38.	Eats with fork
S H E	39.	Gets drink unassisted
S H D	40.	Dries own hands
S H G	41.	Avoids simple hazards
S H G	42.	Puts on coat or dress unassisted
O	43.	Cuts with scissors
C	44.	Relates experiences
		III-IV
L	45.	Walks downstairs one step per tread
S	46.	Plays cooperatively at kindergarten level
S H D	47.	Buttons coat or dress
O	48.	Helps at little household tasks
S	49.	"Performs" for others
S H D	50.	Washes hands unaided
		IV-V
S H G	51.	Cares for self at toilet
S H D	52.	Washes face unassisted
L	53.	Goes about neighborhood unattended
S H D	54.	Dresses self except tying
O	55.	Uses pencil or crayon for drawing
S	56.	Plays competitive exercise games
		V-VI
O	57.	Uses skates, sled, wagon
C	58.	Prints simple words
S	59.	Plays simple table games
S D	60.	Is trusted with money
L	61.	Goes to school unattended
		VI-VII
S H E	62.	Uses table knife for spreading
C	63.	Uses pencil for writing
S H D	64.	Bathes self assisted
S H D	65.	Goes to bed unassisted

		VII-VIII
S H G	66.	Tells time to quarter hour
S H E	67.	Uses table knife for cutting
S	68.	Disavows literal Santa Claus
S	69.	Participates in pre-adolescent play
S H D	70.	Combs or brushes hair
		VIII-IX
O	71.	Uses tools or utensils
O	72.	Does routine household tasks
C	73.	Reads on own initiative
S H D	74.	Bathes self unaided
		IX-X
S H E	75.	Cares for self at table
S D	76.	Makes minor purchases
L	77.	Goes about home town freely
		X-XI
C	78.	Writes occasional short letters
C	79.	Makes telephone calls
O	80.	Does small remunerative work
C	81.	Answers ads; purchases by mail
		XI-XII
O	82.	Does simple creative work
S D	83.	Is left to care for self or others
C	84.	Enjoys books, newspapers, magazines
		XII-XV
S	85.	Plays difficult games
S H D	86.	Exercises complete care of dress
S D	87.	Buys own clothing accessories
S	88.	Engages in adolescent group activities
O	89.	Performs responsible routine chores
		XV-XVIII
C	90.	Communicates by letter
C	91.	Follows current events
L	92.	Goes to nearby places alone
S D	93.	Goes out unsupervised daytime
S D	94.	Has own spending money
S D	95.	Buys all own clothing
		XVIII-XX
L	96.	Goes to distant points alone
S D	97.	Looks after own health
O	98.	Has a job or continues schooling
S D	99.	Goes out nights unrestricted
S D	100.	Controls own major expenditures
S D	101.	Assumes personal responsibility
		XX-XXV
S D	102.	Uses money providently
S	103.	Assumes responsibilities beyond own needs
S	104.	Contributes to social welfare
S D	105.	Provides for future

XXV+

O	106.	Performs skilled work
O	107.	Engages in beneficial recreation
O	108.	Systematizes own work
S	109.	Inspires confidence
S	110.	Promotes civic progress
O	111.	Supervises occupational pursuits
S D	112.	Purchases for others
O	113.	Directs or manages affairs of others
O	114.	Performs expert or professional work
S	115.	Shares community responsibility
O	116.	Creates own opportunities
S	117.	Advances general welfare

The primary consideration in the diagnosis of mental deficiency is social incompetence. Mental incompetence due to arrested development accounts for this social incompetence among those called feeble-minded. This developmental retardation of both social and mental competence is essential to distinguish between deficiency as contrasted with deterioration. Heretofore this distinction could not be precisely made because of the difficulty of estimating social competence in children and predicting therefrom the prospective adult level of competence. The recently developed Vineland Social Maturity Scale provides an instrument for the relatively precise measurement of social competence at all ages from birth to maturity. This scale, methodologically patterned after the Binet-Simon Scale, employs a developmental hierarchy of behavioral performances which reflect personal independence and social responsibility. The behavioral performances which constitute the detailed items of the scale may be roughly grouped in such categories as self-help, locomotion, occupation, communication, self-direction, and socialization, with self-direction as a general factor in all categories. Preliminary description, standardization, and validation of the scale have already been reported[3] and a more extensive description of the method and these preliminary results is in preparation.

The present report deals with the application of this scale to a small group of children in the special classes of the public schools of Vineland, New Jersey. The study is offered as an illustrative application of the method, and as indicating the possibilities for further work. The method does not require the child to respond to specific test situations, but rather

[3]Doll, Edgar A. *The Vineland Social Maturity Scale: Revised Condensed Manual of Directions.* Publication of the Training School at Vineland, N. J., Department of Research. Series 1936, No. 3 (April, 1936), pp. 30.

"Preliminary Standardization of the Vineland Social Maturity Scale," *American Journal of Orthopsychiatry* VI (April, 1936), pp. 283-93.

affords an objective description of his habitual or customary performances. The examination is therefore conducted as a report rather than as a test, and deals with detailed statements of habitual behavior which may be reduced to standard scores which are normative for successive life ages. The standard method provides for examining the child through an informant other than himself, but also permits the subject to act as his own informant. In the present study both methods were employed, examining the child directly by having him act as his own informant, and checking this with examinations employing his teacher and a near relative, such as father or mother, as informant. It is important to note that the results from several informants are not pooled for a single score. On the contrary, the scores are obtained independently for each informant and the adequacy of the information is determined by the examination method. If the informant is not adequately informed in respect to the details of each behavioral item, this is reflected in the examination as a whole and such examinations are considered invalid.

The results obtained from different informants are not experimentally treated in this report. What is important for school purposes is the fact that it was found practicable to examine the child acting as his own informant. The children in the special classes showed insight into their own behavior and were capable of describing that behavior in detail under the conditions provided by this examination. Parents need not be sought as informants, and teachers, who are likely to be uniformed with respect to the child's aptitudes outside of school need not be called upon except for general information. For the purpose of the present study, the scores based on information obtained from parents were used for final treatment.[4]

[4] Scores are expressed as "social ages" which are broadly comparable to Binet mental ages. Social quotients are derived from social ages in the same manner as intelligence quotients are derived from mental ages, with the exception that the upper life age divisor for S. Q.'s is 25 years, whereas for I. Q.'s this is 14 years, these being the respective average adult age limits of the scores. These quotients are employed tentatively pending the solution of the difficult question of the validity of quotient methods of expressing results. From other investigations we may tentatively and roughly consider social quotients below 70 as associated with feeble-mindedness and quotients above 80 as associated with normality, but these quotients should not be considered diagnostic unless supported by other clinical data. With adults over 25 years of age, S. A. 20 years is tentatively considered indicative of social adequacy, other considerations aside. There is a tendency for S. Q.'s of feeble-minded children to decrease with age, the rate of growth being related to both L. A. and final S. A. with S. A.'s reaching an upper limit at about L. A. 18 years. It is of course necessary to interpret these quotients in the light of other clinical considerations and especially with reference to special handicaps such as blindness, deafness, crippling, and the like, which require special interpretation.

Thirty-eight children from three special classes in the town of Vineland, N. J., were examined with this scale. Each of these special class children was paired with a mentally deficient child[5] of the same life age and mental age, and consequently of the same I. Q. The subjects were also paired as to sex as far as practicable, but the limited number of girls in the institution at these L. A. and M. A. levels made it impracticable to pair all subjects by sex. However, this difficulty is of no importance since significant sex differences are not apparent either in the Binet scores or in the social maturity scores in the normative standardizations of these scales or in experimental investigations with special class and institutional groups.

The means, S. D.'s, and extreme range of data for the two groups of subjects are presented in Table I. Slight differences in selecting suitable pairs are revealed in the table. Of course the subjects were not paired for S. A. and S. Q, since these comparisons are the major object of the study. From Table I it will be observed that the mean L. A. of both groups was 12 years, the mean M. A. 7 years, and the mean I. Q. 60. More precise figures, and the range of deviation, are evident from the table. I. Q.'s for L. A.'s above 14 years were calculated on a 14-year basis. S. Q.'s were calculated according to actual life ages in all cases (all subjects being under L. A. 25 years).

TABLE I

DESCRIPTION OF SUBJECTS

	Mean		S. D.		Range	
	Inst.	Sp. Class	Inst.	Sp. Class	Inst.	Sp. Class
L. A.	12.6	12.2	2.3	2.4	8.5-16.3	7.5-16.0
S. A.	7.0	9.4	1.6	1.8	3.0-10.0	5.8-15.0
M. A.	7.3	7.2	1.3	1.5	3.0- 9.7	3.0-10.0
S. Q.	57	78	13	12	25-81	59-96
I. Q.	61	63	9	11	41-76	39-82

The I. Q. and S. Q. distributions are plotted correlatively in Table II for special class subjects, and in Table III for institutional subjects. Since the subjects are paired for L. A., the quotient scores for intelligence and social maturity may properly be taken in lieu of the absolute scores which are not presented here.

[5] From The Training School at Vineland, N. J., a private institution for the mentally deficient.

From Table II we note that 27 of the special class subjects have I. Q.'s below 70, 10 have I. Q.'s of 70-80, and 1 has I. Q. of 80-90. Ten have S. Q.'s below 70, 10 have S. Q.'s of 70-80, 8 have S. Q.'s of 80-90, and 10 have S. Q.'s of 90-100. The mean I. Q. (calculated from ungrouped data) is 63, and the mean S. Q. is 78.

In the institutional group we find 33 subjects with I. Q.'s below 70 and 5 with I. Q.'s of 70-80. Thirty-two have S. Q.'s below 70, 5 have S. Q.'s of 70-80, and 1 has an S. Q. of 80-90. The mean I. Q. of this group is 61,[6] and the mean S. Q. is 57.

The mean S. Q. of the special class group is 15 points *above* the corresponding mean I. Q. In the institutional group the mean S. Q. is 4 points *below* the corresponding mean I. Q. The difference of the S. Q. means is 21 points in favor of the special class group, or nearly 40 percent superiority. The standard error of this difference is 2.9 which gives a critical ratio of 7.1, indicating a reliable difference.

As noted previously, the I. Q. distributions are substantially identical because the subjects were paired for I. Q. We may infer from these tables that when special class mentally subnormal children are compared with institutional mentally subnormal children of the same life age and Binet intelligence, the special class subjects as a group are found to be distinctly superior to the institutional subjects in social competence, and among themselves to have S.Q.'s nearly 25 percent above their I.Q.'s. Forty-seven percent of these special class subjects are found within the low-average normal range of the normal distribution (S.Q. 80-100), twenty-six percent are found in the borderline range for deficiency (S.Q. 70-80), and twenty-six percent are found below this borderline limit (S. Q. below 70). In the institutional group, on the other hand, only three percent are within the low-average normal range, thirteen percent are at the borderline, and eighty-four percent are below the borderline. It is therefore obvious that these special class children are socially more capable than these institutional feeble-minded of the same life ages and Binet mental ages.

An explanation of this difference may be sought in the differences in the environments surrounding the two groups. The special class children are living more or less freely in their own homes, whereas the institutional children are living under institutional control. In the particular institution in question, the consequent regimentation of daily life is not severe from the point of view of limiting the environmental oppor-

[6] Slight differences in the ungrouped I. Q. pairs are exaggerated in the grouped data, the mean I. Q. difference being only 2 points.

TABLE II

RELATION BETWEEN S. Q. AND I. Q. FOR SPECIAL CLASS SUBJECTS

S. Q. \ I. Q.	30	40	50	60	70	80	N
50		1					1
60	2		3	2	2		9
70		2	4	2	2		10
80			3	4	1		8
90			1	3	5	1	10
N	2	3	11	11	10	1	38

Median S. Q. = 79
Mean S. Q. = 78

Median I. Q. = 63
Mean I. Q. = 63

$r = .50 \pm .08$

TABLE III

RELATION BETWEEN S. Q. AND I. Q. FOR INSTITUTIONAL SUBJECTS

S. Q. \ I. Q.	30	40	50	60	70	80	N
20		1					1
30			3				3
40	1	2	1	1			5
50			3	7	1		11
60			6	5	1		12
70				3	2		5
80					1		1
N	1	3	13	16	5		38

Median S. Q. = 59
Mean S. Q. = 57

Median I. Q. = 61
Mean I. Q. = 61

$r = .68 \pm .06$

tunities for the expression of social maturity. Such inhibitions to expression seem to be commensurately offset by corresponding facilitation in other directions. At any rate, an analysis of the items which compose the scores does not reveal that the institutional group is "held down" by

the institutional environment. It is, if anything, for these subjects rather more favorable than the home environment of the special class group, all things considered.

Another explanation may be sought on the basis of selection. The special class children are selected principally on the basis of low Binet intelligence scores coupled with low educational achievement, accompanied to some extent by poor home environment. Only one of the special class children has an I. Q. above 80, whereas 18 of them have S. Q.'s above 80. It may be argued, and indeed it is one of the important issues of this study, that the Binet score may not be a true measure of the intelligence of these subjects. The Binet scale is a verbal type of intelligence test, and the school record of these subjects shows verbal inaptitude. It is therefore conceivable that these special class subjects might do better on other intelligence tests than the Binet, especially non-verbal tests. This presumption is reinforced by the fact that the correlation between M. A. and S. A. (data not presented) for this special class group is $r = .61 \pm .06$, whereas for the institutional group this correlation is $r = .76 \pm .04$. These correlations are influenced by the small number of subjects and the relatively narrow range of the distributions, but it is significant that the correlations are statistically reliable in relation to their probable errors and that the institutional group shows a significantly higher coefficient. This suggests that the M. A.'s of these special class subjects may be less representative of their true intelligence than is the case with these institutional subjects.

It is this very fact that seems to us important in making a distinction between mentally subnormal and feeble-minded subjects. The institutional subjects have been diagnosed as feeble-minded on the basis of complete clinical considerations involving interpretation of developmental history and the application of comprehensive psychometric examinations. They show corresponding mental retardation in mental tests other than Binet. But previous investigations have revealed that special class children who test low on Binet may test relatively close to average on other mental tests. It is therefore this discrepancy between verbal intelligence and non-verbal intelligence that is so important in special class children and in the implications for their public school education. Moreover, the S. Q.'s of these feeble-minded tend to fall *below* their I. Q.'s, whereas among the special class subjects the S. Q.'s run markedly *higher* than their I. Q.'s.

It seems reasonable, therefore, to suggest the hypothesis that when both S. Q. and Binet I. Q. are below 70, the individual may be feeble-minded; that when both S. Q. and Binet I. Q. are above 80 the individual may be normal, even if dull-normal; and that when either S. Q. or I. Q. is below 80 the individual may be borderline. In the last group we may also hypothecate a suspicion of normality when the S. Q. is above the I. Q.[7]

These assumptions must be considered as at present only hypotheses. They should be verified by the application of the complete diagnostic syllabus for both feeble-mindedness and dull-normals. This consideration was not possible for the special class group in this study. The verification of this hypothesis must therefore be left for further work. The distinction is important because of the educational implications, namely, that at maturity the feeble-minded person will continue to need social supervision, whereas the dull-normal child will be able to get along socially on his own, even though possibly at a low level.

It may be noted in this connection that in this special class group, only about one-quarter of the I. Q.'s are above 70, whereas in many special class groups this percentage is much higher. In many representative special class groups, only one-quarter of the class is feeble-minded and three-quarters are dull-normal. The verification of this generalization may be found in the use of this scale for measuring social competence which separates the incompetent subnormals from the competent in terms of social ability.[8]

Since these special class subjects were not differentially diagnosed by the complete syllabus, it is not possible to say to what extent the actually feeble-minded special class children were socially more or less competent than the feeble-minded in the institution. We are therefore not able from this study to answer the question whether the genuinely feeble-minded who go to institutions are less socially competent than the feeble-minded who go to special classes, or whether this distinction is due to other causes such as conduct disorders, environmental maladjustment, poor environment, dependency, special handicaps, and the like. It is, however, important to raise the question whether feeble-mindedness as such requires institutional commitment or whether the majority of feeble-minded chil-

[7] These rough generalizations are, of course, influenced by the actual values of the quotients and the differences between them.

[8] Anderson, Meta. "Education for Social Maturity," *The Training School Bulletin*, XXXIII (February, 1937), pp. 185-92.

dren can be adjusted in their homes or in the community, either while attending special classes or after leaving school. The social objectives of public education would seem to place definite responsibility upon public school officials for some concern regarding the social welfare of the mentally subnormal, and especially the feeble-minded who leave school, in relation to their social competence.

Further consideration of Table I reinforces the above observations. Although the L. A.'s, M. A.'s, and I. Q.'s are closely similar for the two groups, the mean S. A. of the special class group is 2.4 years, or approximately one-third, higher than that of the institutional group. Moreover, whereas in the institutional group the mean S. A. is .3 years below the mean M. A., this situation is reversed in the special class group where the S. A. is 2.2 years above the M. A.

Special interest attaches to the analysis of differences in the individual items of the scale. In the normal standardization of the scale the item sequences are calibrated by the Thomson method, a statistical procedure which permits a precise determination of the mean age value of each item with corresponding standard deviation. This permits the calculation of comparative differences with known statistical reliability if the range of subjects is sufficient. In this study, the range of subjects is too limited to permit a comparison of differences on the basis of such item calibration. As a substitute method, we may study the comparative difficulty of items according to the total percentage of passes for each item in the two groups. This permits a comparison of differences for the two groups as wholes without reference to the location of the items in the normative sequence. This material is presented in Table IV.

It is immediately evident from this table that certain items show important differences in difficulty for the two groups, both as compared with each other and as compared with the normal calibration of the scale, where the items are in a progressive order of difficulty. We note that the special class children excel the institution children in every item except one, item 78, "writes occasional short letters." For all other items the most that can be said for the institution group is that the special class superiority does not exceed 20 points in the comparative percents of passes for each item. There are 19 items, out of the 61 included in the total range of the examining, on which the special class children are superior by a difference of 20 or more in the comparative percents of item "passes." On the remaining 42 items these differences are less than 20.

TABLE IV

COMPARATIVE PERFORMANCE ON DETAILED ITEMS

No.	Item	Year	Inst. % +	Sp. Class % +	% Diff.
		II-III			
35.	Asks to go to toilet		100	100	0
36.	Initiates own play activities		100	100	0
37.	Removes coat or dress		100	100	0
38.	Eats with fork		93	100	7
39.	Gets drink unassisted		100	100	0
40.	Dries own hands		95	100	5
41.	Avoids simple hazards		99	100	1
42.	Puts on coat or dress unassisted		100	100	0
43.	Cuts with scissors		95	100	5
44.	Relates experiences		95	100	5
		III-IV			
45.	Walks downstairs one step per tread		97	100	3
46.	Plays coöperatively at kindergarten level		95	100	5
47.	Buttons coat or dress		97	100	3
48.	Helps at little household tasks		92	99	7
49.	"Performs" for others		91	100	9
50.	Washes hands unaided		91	100	9
		IV-V			
51.	Cares for self at toilet		95	100	5
52.	Washes face unassisted		83	100	17
53.	Goes about neighborhood unattended		75	100	25
54.	Dresses self except tying		84	100	16
55.	Uses pencil or crayon for drawing		79	99	20
56.	Plays competitive exercise games		78	100	22
57.	Uses skates, sled, wagon		78	95	17
58.	Prints simple words		72	90	18
59.	Plays simple table games		67	95	28
60.	Is trusted with money		18	96	78
61.	Goes to school unattended		57	95	38
		VI-VII			
62.	Uses table knife for spreading		92	97	5
63.	Uses pencil for writing		45	53	8
64.	Bathes self assisted		74	97	23
65.	Goes to bed unassisted		41	88	47
		VII-VIII			
66.	Tells time to quarter hour		36	47	11
67.	Uses table knife for cutting		79	86	7
68.	Disavows literal Santa Claus		47	72	25
69.	Participates in pre-adolescent play		54	58	4
70.	Combs or brushes hair		70	92	22
		VIII-IX			
71.	Uses tools or utensils		34	96	62
72.	Does routine household tasks		58	75	17
73.	Reads on own initiative		3	3	0
74.	Bathes self unaided		20	65	45
75.	Cares for self at table		67	80	13
76.	Makes minor purchases		0	38	38
77.	Goes about home town freely		3	76	73

No.	Item	Year	Inst. % +	Sp. Class % +	% Diff.
		X-XI			
78.	Writes occasional short letters		22	11	—11
79.	Makes telephone calls		3	11	8
80.	Does small remunerative work		0	47	47
81.	Answers ads; purchases by mail		4	8	4
		XI-XII			
82.	Does simple creative work		4	42	38
83.	Is left to care for self or others		0	62	62
84.	Enjoys books, newspapers, magazines		0	3	3
		XII-XV			
85.	Plays difficult games		3	8	5
86.	Exercises complete care of dress		5	37	32
87.	Buys own clothing accessories		0	28	28
88.	Engages in adolescent group activities		3	0	3
89.	Performs responsible routine chores		0	8	8
		XV-XVIII			
90.	Communicates by letter		0	3	3
91.	Follows current events		0	0	0
92.	Goes to nearby places alone		0	0	0
93.	Goes out unsupervised daytime		0	3	3
94.	Has own spending money		0	3	3
95.	Buys all own clothing		0	1	1

These differences may be taken as an indication of the detailed manner in which the abilities of the special class group differ from those of the institutional group, and both of them from the average normal. Taking the differences in the total percents of passes as an index of comparative difficulty, the sequence of items in Table IV is rearranged in Table V. This shows the hierarchy of comparative difficulty of these items for the feeble-minded as compared with the special class subjects where the difference in percents of passes is more than 19, regardless of scaling difficulty. These comparisons are influenced to some extent by the institutional environment which offers less opportunity in respect to some of these items and more opportunity in respect to others as compared with the environment in which the special class group lives.

These differences become more informing when the items are grouped in categories as in Table VI. This table is helpful in showing the significance of the superior social competence of the special class children as to the kinds of performances involved. These relations are as follows (reading Table VI):

On the 4 items of self-help general the special class pupils are not markedly superior to the institution children on any items. And similarly for the 5 items on self-help eating and the 10 items on communication. In these categories the institution group is (marginally) "holding its own."

TABLE V

COMPARATIVE DIFFICULTY OF ITEMS

No.	Item	Diff.*
60.	Is trusted with money	78
77.	Goes about home town freely	73
83.	Is left to care for self or others	62
71.	Uses tools or utensils	62
80.	Does small remunerative work	47
65.	Goes to bed unassisted	47
74.	Bathes self unaided	45
82.	Does simple creative work	38
76.	Makes minor purchases	38
61.	Goes to school unattended	38
86.	Exercises complete care of dress	32
87.	Buys own clothing accessories	28
59.	Plays simple table games	28
68.	Disavows literal Santa Claus	25
53.	Goes about neighborhood unattended	25
64.	Bathes self assisted	23
70.	Combs or brushes hair	22
56.	Plays competitive exercise games	22
55.	Uses pencil or crayon for drawing	20

*Superiority of special class group based on differences in percent passing for all items where this difference exceeds 19 in Table IV.

On self-help dressing the special class children are significantly superior on 5 of 12 items, on self-direction on 4 of 7 items, on locomotion on 3 of 5 items, on occupation on 4 of 10 items, and on socialization on 3 of 8 items.

TABLE VI

CATEGORICAL ARRANGEMENT OF DIFFERENTIAL ITEMS

Category		Items	Total No. Items (35-95)	No. showing Sp. Class superior to Inst. (from Table V)
Self-help general			4	0
Self-help eating			5	0
Self-help dressing	64.	Bathes self assisted	12	5
	65.	Goes to bed unassisted	..	..
	70.	Combs or brushes hair	..	..
	74.	Bathes self unaided	..	..
	86.	Exercises complete care or dress	..	..
Self-direction	60.	Is trusted with money	7	4
	76.	Makes minor purchases	..	..
	87.	Buys own clothing accessories	..	..
	83.	Is left to care for self or others	..	..
Locomotion	53.	Goes about neighborhood unattended	5	3
	61.	Goes to school unattended	..	..
	77.	Goes about home town freely	..	..
Communication			10	0
Occupation	55.	Uses pencil or crayon for drawing	10	4
	71.	Uses tools or utensils	..	..
	80.	Does small remunerative work	..	..
	82.	Does simple creative work	..	..
Socialization	56.	Plays competitive exercise games	..	..
	59.	Plays simple table games	8	3
	68.	Disavows literal Santa Claus	..	..
		Total	61	19

As noted previously, self-direction is a general factor in practically all items as well as a special consideration on the group of performances specifically categorized as self-direction.

In brief, the special class is noticeably superior on one-third of all items, but rather more so on those where self-direction carries most weight. Does the institution environment penalize the child on self-direction while favoring him on self-help and communication? Perhaps. But more probably the training programs of the institution and the special class make the best of their respective situations *according to what each child can learn and will make use of* in the light of each child's personal aptitudes.

No attempt is made here to comment at length on these differences as derived from the case studies of each subject. It is significant that the general inferiority in social competence of the institutional group is confirmed throughout the item analysis regardless of advantage or disadvantage resulting from the regimen of the comparative environments. Which tempts us to conclude that the same need for controlled behavior which brought the child to the institution instead of to the special class produces rather than results from the apparent lack of freedom in the institution as compared with the community.

REPORT OF CLASS SIZE INVESTIGATIONS IN THE PHOENIX UNION HIGH SCHOOL, 1933-34 TO 1935-36

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THE STUDY MADE IN 1933-34

IN 1933-34 a controlled experiment was conducted in the Phoenix Union High School to ascertain the relative efficiency of instruction in large and small classes on three ability levels. The efficiency of instruction was measured by (1) results of standardized objective tests, (2) scores on new type objective tests, (3) reports of estimates made by observers, (4) the opinions of the teachers conducting the classes, and (5) the Hand-Carley "Student Reaction Form."

The study was made with classes in eleventh grade American History and English. Three hundred sixty students and six teachers were involved in the investigation. A detailed description of the techniques employed in this study would require too much space to report here. The reader who is interested in the details of the investigation may consult the original report of the study.[1] The conclusions from this investigation, briefly stated, are as follows:

1. Class size is an unimportant factor in determining the efficiency of instruction on any ability level when efficiency is measured by means of objective tests.
2. The students of the upper ability level in American history and English did slightly better in small classes than in large ones though the difference was not significant.
3. Students of the middle ability level in American history did slightly better in small classes than in large ones, but the advantage did not prove to be statistically significant.
4. Students of the middle ability level in English did significantly better in large classes than in small ones.
5. Students of the lower ability level in both American history and English did slightly better in large classes than in small ones though the difference might be accounted for by the operation of chance factors.
6. The teachers' opinions of the efficiency of large classes corresponded very closely to the success which they experienced with the large classes.

[1] Eastburn, Lacey A. *Relative Efficiency of Instruction in Large and Small Classes on Three Ability Levels* (Unpublished Doctors Dissertation, Stanford University, 1936), 451 pp.

7. Class size did not prove to be an important factor in determining student attitudes as measured by the Hand-Carley "Student Reaction Form."

8. Class size had no appreciable effect upon the disciplinary problems arising on any of the three ability levels.

9. The amount of inattention observed bore no relation to the size of class.

THE CLASS SIZE INVESTIGATION OF 1934-35

The pupil-period load of the teachers in the 1933-34 study was not increased beyond the normal load to which the teachers were accustomed. The number of classes was reduced from five to four as the one large class which each teacher taught was just twice the customary size of classes. The problem of the present study was to determine whether or not the same degree of efficiency of instruction in large classes would be maintained when the teachers taught five large classes instead of one large and three small classes.

Organization of the Study.—The experiment was carried on in the English Department of the Phoenix Union High School during the year 1934-35 and is being continued during 1935-36. The same organization and procedures used in 1934-35 are being used in 1935-36. The three teachers who taught the large classes in eleventh grade English in the 1933-34 study agreed to teach five large classes on the same ability level during the year 1934-35. The same course of study, study guides, objective tests, and techniques of instruction were used as had been used the previous year. The three teachers were provided with a competent stenographer who mimeographed all tests and study guides, graded objective tests, recorded test scores, and made out all required reports. The teachers were then freed from the detail work so that they were able to devote their full time to constructive teaching, preparation of materials, and personal conferences with students.

Method of pairing.—All students in these fifteen large classes were given the Columbia Research Bureau English Test.[2] From the 250 students assigned to each teacher sixty were selected who were mated with the sixty students who composed the two small classes that served as the control group the year previously. These groups were of the same ability level and were taught by the same teacher in 1933-34 and 1934-35. The

[2] Steeves, Harrison R., Abbott, Allan, and Wood, Ben D. *Columbia Research Bureau English Test.* Yonkers: World Book Company, 1926.

groups were paired student for student on the basis of (1) the scores made on the Columbia Research Bureau English Test; (2) the raw scores made on the Otis Classification Test given upon the completion of the eighth grade; (3) the marks earned during the ninth and tenth grades (a mark of "1" was given a value of four, a mark of "2" was given a value of three, etc.); (4) chronological age; and (5) sex.

Table I gives the means of the scores on the Otis Classification Test, the Columbia Research Bureau English Test, previous grade points and chronological age of the 1933-34 small classes and of the students from the 1934-35 large classes with whom they were paired. A careful inspection of the data will show that the groups were closely paired on all of the criteria except the groups on the middle and lower ability levels on the scores of the Columbia Research Bureau English Test. The 1934-35 students failed to attain as high scores on the initial test in English as did the students in 1933-34. The investigators were unable to explain why the students in 1934-35 failed to score as high on this initial test as did the students of the previous year. However, since achievement in all cases was measured by the gains of the final scores over the initial scores, it was not felt that this comparatively small difference in the initial state of mastery in English would materially affect the validity of the results of the investigation.

Measurement of achievement.—Achievement in the large and small classes was measured by means of objective tests. Both standardized and new type tests were utilized. The tests used and the time at which they were given were:

1. *Standardized tests.*
   a. Columbia Research Bureau English Test.[3]
   b. Iowa Placement Test: English Training.[4]
   c. Iowa High School Content Examination:[5] Literature Section.

In the case of each of these three standardized tests, Form A was given at the beginning of the year and Form B was administered near the close. Achievement was measured by the difference in scores of Form B over Form A.

[3] *Loc. cit.*

[4] Carpenter, M. F., and Stoddard, G. D. under the direction of C. E. Seashore and G. M. Ruch, *Iowa Placement Examination: English Training,* Iowa City: University of Iowa, 1924.

[5] Ruch, G. M., Huffaker, C. L., Knight, F. B., and Koerth, W. *Iowa High School Content Examination,* Iowa City: University of Iowa, 1924.

TABLE I

SUMMARY OF THE MEANS OF THE SCORES ON THE OTIS CLASSIFICATION TEST, THE COLUMBIA RESEARCH BUREAU ENGLISH TEST, PREVIOUS GRADE POINTS, AND CHRONOLOGICAL AGE OF THE PAIRED STUDENTS IN THE LARGE CLASSES OF 1934-35 AND SMALL CLASSES OF 1933-34 ON THE DIFFERENT ABILITY LEVELS

Group	Ability Level	Otis Test	C.R.B. English Test	Previous Grade Points	Chronological Age
Small 33-34	Upper	152.16	135.65	42.19	15.90
Large 34-35	Upper	150.80	134.78	47.75	15.81
Small 33-34	Middle	129.79	110.14	36.48	16.03
Large 34-35	Middle	130.48	96.02	35.61	16.19
Small 33-34	Lower	107.10	92.89	29.27	16.52
Large 34-35	Lower	107.78	80.03	27.61	16.19

2. *New Type Objective Tests.*

a. *Semester Examinations.* Each teacher constructed a comprehensive semester examination of 200 or more items for each of the two semesters. In each case these examinations were given at the beginning of the semester and repeated at the close. The differences of the final scores over the initial scores were used as a measure of achievement.

Table II gives the means of the differences, the probable error of the differences, and the probable error ratios between the scores of the pupils in the small classes and that of their mates in the large classes in the various tests mentioned above. The mean of the difference was computed according to "Students" method as described by Ezekiel.[6]

The results of the five achievement tests summarized in Table II show that the large classes on the upper ability level excelled their mates on three of the five tests given during the year. The sum of the five tests gave results slightly in favor of the large classes, though the difference was not significant.

The students of the large classes on the middle ability level made higher scores than did their mates in the small classes on four of the five tests, and on two of these tests the differences were highly significant. The sum of the results of the five tests gave a significant difference in favor of the large classes.

The students of the large classes on the lower ability level exceeded the scores of their mates in the small classes on four of the five tests. The sum of the five tests gave a probable error ratio of 3.70 in favor of the large classes, which indicates that the probability is rather small that this difference was due to the operation of chance factors.

[6] Ezekiel, Mordecai. "Students' Method for Measuring the Significance of a Difference between Matched Groups," *The Journal of Educational Psychology*, XXIII (September, 1932), pp. 446-450.

A Second Pairing.—Another group of students were selected from the large classes of 1934-35 who were paired with the large class of 1933-34. This was done in order to check the results presented above, and also to determine whether the teachers' efficiency in handling large classes was greater when one large and three small classes were taught (as was the case in 1933-34) than when five large classes were taught. The pairing was done in the same manner as used in the preceding groups.

TABLE II

SUMMARY OF THE MEANS OF THE DIFFERENCES AND THE PROBABLE ERROR RATIOS BETWEEN THE SCORES OF THE STUDENTS IN THE SMALL CLASSES AND THAT OF THEIR MATES IN THE LARGE CLASSES OF THE DIFFERENT ABILITY LEVELS

Test	Mean of Diff.	PE$_D$	Mean$_D$ / PE$_D$	Chances in 100
I. Large and Small Classes on the Upper Ability Level				
First Semester Examination*	—5.05	2.63	—1.92	90.0-L
Second Semester Examination	—15.41	2.65	—5.82	99.9-L
C.R.B. English Test	11.98	2.66	4.50	99.9-S
Iowa Placement-Eng. Test	—5.26	2.20	—2.39	95.0-L
Iowa H.S. Content-Lit. Sect.	4.04	1.10	3.67	98.0-S
Total of these five tests**	—4.00	3.61	—1.11	77.0-L
II. Large and Small Classes on the Middle Ability Level				
First Semester Examination	—21.28	2.12	—10.04	99.9-L
Second Semester Examination	—17.77	2.79	—6.37	99.9-L
C.R.B. English Test	—0.62	2.58	—0.24	57.0-L
Iowa Placement-Eng. Test	—4.70	2.83	—1.66	87.0-L
Iowa H.S. Content-Lit. Sect.	2.69	1.33	2.02	91.0-S
Total of these five tests	—24.30	4.92	—4.92	99.9-L
III. Large and Small Classes on the Lower Ability Level				
First Semester Examination	—20.28	2.90	—6.99	99.9-L
Second Semester Examination	—8.94	2.88	—3.10	98.0-L
C.R.B. English Test	—3.39	2.95	—1.15	78.0-L
Iowa Placement-Eng. Test	—8.82	2.74	—3.22	98.5-L
Iowa H.S. Content-Lit. Sect.	0.14	1.41	4.35	99.9-S
Total of these five tests	—17.19	4.65	—3.70	99.0-L

* The difference between the final score and the initial score of the student in the large class was subtracted from that of his mate in the small class, hence the negative sign indicates that the difference is in favor of the large class.

** The scores on the different tests were combined after they had been converted into standard scores in accordance with the method given by Hull and described by H. E. Garrett, *Statistics in Psychology and Education* (New York: Longmans, Green and Company, 1926), pp. 281-284.

Table III gives the mean scores on the pairing of the large class of 1933-34 with students from the five large classes of 1934-35 on the three different ability levels. It will be noticed that here the students of 1934-35 did not make as high scores on the Columbia Research Bureau English Test as did the students of the preceding year. Since the pairing is remarkably close on the other criteria, and also since only gains made on

the different tests are used, the difference in the initial scores on the English test should not invalidate the results of the investigation.

TABLE III

SUMMARY OF THE MEANS OF THE SCORES ON THE OTIS CLASSIFICATION TEST, THE COLUMBIA RESEARCH BUREAU ENGLISH TEST, PREVIOUS GRADE POINTS, AND CHRONOLOGICAL AGE OF PAIRED STUDENTS OF THE 1933-34 LARGE CLASSES AND THE 1934-35 LARGE CLASSES ON THE DIFFERENT ABILITY LEVELS

Group	Ability Level	Otis Test	C.R.B. English Test	Previous Grade Points	Chronological Age
Large, 33-34	Upper	148.59	134.50	42.58	15.94
Large, 34-35	Upper	147.75	129.33	46.18	15.83
Large, 33-34	Middle	134.12	109.91	36.16	16.20
Large, 34-35	Middle	137.85	91.28	35.10	16.62
Large, 33-34	Lower	111.86	92.88	31.97	16.37
Large, 34-35	Lower	108.91	72.16	25.75	16.31

Measurement of Achievement.—The achievement was measured in exactly the same manner as that used with the large and small classes, namely the gain in the final scores over the initial scores on the five tests.

Table IV gives a summary of the test results of the large class of 1933-34 compared with that of their mates selected from the large classes of 1934-35. All computations were made in the same manner as that described for the preceding groups. The data of this table show that when all tests for the year are combined there was practically no difference between the accomplishment, as measured by objective tests, of the large classes of 1933-34 when the teachers were carrying a normal load and that of the large classes of 1934-35 when the teachers were teaching five large classes with the assistance of one stenographer for the three teachers.

CONTINUATION OF INVESTIGATION, 1935-36

The investigation carried on during the year 1934-35 was continued during the year 1935-36. The same three teachers, with the assistance of a stenographer, each taught five large classes.

In the interest of economy two of the standardized tests, the "Iowa Placement Test: English Training," and the "Iowa High School Content Examination: Literature Section," were omitted from the testing program. This economy measure was decided upon after it was observed that the omission of these tests from the 1934-35 investigation would not have affected the results materially.

Pairing of large and small classes.—Again the eleventh grade English students in the large classes of 1935-36 were paired with the students of the small classes of 1933-34. The students were paired on the same criteria as were those of the preceding year.

TABLE IV

SUMMARY OF THE MEANS OF THE DIFFERENCES AND THE PROBABLE ERROR RATIOS BETWEEN THE SCORES OF THE STUDENTS IN THE LARGE CLASSES OF 1933-34 AND THAT OF THEIR MATES CHOSEN FROM THE LARGE CLASSES OF 1934-35 ON THE DIFFERENT ABILITY LEVELS

Test	Mean of Diff.	PE_D	$\frac{\text{Mean}_D}{PE_D}$	Chances in 100
I. Large Class of 1933-34 Compared with Large Classes of 1934-35 on the Upper Ability Level.				
First Semester Examination*.....	—6.06	3.78	—1.60	86.0-(34-35)
Second Semester Examination.....	—17.09	2.70	—6.33	99.9-(34-35)
C.R.B. English Test.....	7.95	1.92	4.14	99.9-(33-34)
Iowa Placement-Eng. Test.....	2.54	2.74	0.93	74.0-(33-34)
Iowa H.S. Content-Lit. Sect.....	3.59	1.14	3.15	98.0-(33-34)
Total of these five tests**.....	0.48	5.04	0.10	53.0-(33-34)
II. Large Class of 1933-34 Compared with Large Classes of 1934-35 on the Middle Ability Level.				
First Semester Examination.....	—20.12	2.03	—9.90	99.9-(34-35)
Second Semester Examination.....	0.14	2.34	0.06	51.0-(33-34)
C.R.B. English Test.....	22.10	2.83	7.80	99.9-(33-34)
Iowa Placement-Eng. Test.....	4.96	1.07	4.65	99.9-(33-34)
Iowa H.S. Content-Lit. Sect.....	2.82	1.19	2.37	95.0-(33-34)
Total of these five tests.....	2.39	4.69	0.51	63.0-(33-34)
III. Large Class of 1933-34 Compared with Large Classes of 1934-35 on the Lower Ability Level.				
First Semester Examination.....	—16.21	3.45	—4.70	99.9-(34-35)
Second Semester Examination.....	0.22	3.88	0.06	51.0-(33-34)
C.R.B. English Test.....	—9.93	2.72	—3.64	99.0-(34-35)
Iowa Placement-Eng. Test.....	—0.09	3.23	—0.03	51.0-(34-35)
Iowa H.S. Content-Lit. Sect.....	5.57	1.64	3.40	98.9-(33-34)
Total of these five tests.....	—7.94	5.16	—1.54	85.0-(34-35)

* The difference between the final score and the initial score of the student in the 1934-35 large class was subtracted from that of his mate in the 1933-34 large class, hence the negative sign indicates that the difference is in favor of 1934-35 large classes.

** The scores on the different tests were combined by the method given by Hull and described by Henry E. Garrett, *Statistics in Psychology and Education* (New York: Longmans, Green and Company, 1926), p. 289.

TABLE V

SUMMARY OF THE MEANS OF THE SCORES ON THE OTIS CLASSIFICATION TEST, THE COLUMBIA RESEARCH BUREAU ENGLISH TEST, PREVIOUS GRADE POINTS, AND CHRONOLOGICAL AGE OF THE PAIRED STUDENTS IN THE LARGE AND SMALL CLASSES ON THE DIFFERENT ABILITY LEVELS

Group	Ability Level	Otis Test	C.R.B. English Test	Previous Grade Points	Chronological Age
Small, 33-34	Upper	152.16	135.65	42.19	15.90
Large, 35-36	Upper	152.18	127.78	44.41	16.00
Small, 33-34	Middle	129.79	110.14	36.48	16.03
Large, 35-36	Middle	129.96	94.32	36.43	16.24
Small, 33-34	Lower	107.10	92.89	29.27	16.52
Large, 35-36	Lower	106.52	79.02	28.58	16.70

Table V gives the means of the scores on the pairing criteria for the 1933-34 small classes and the 1935-36 large classes. Again it will be noticed that the two groups are very closely paired except for the scores on the Columbia Research Bureau English Test. On this test the large classes made scores somewhat below that of the small classes, especially on the middle and lower ability levels.

The probable error ratios derived from a comparison of the scores made by the large classes of 1935-36 and those of the small classes of 1933-34 on the three different tests used in both cases are given in Table VI. Each individual test, with the exception of the first semester examination on the upper and lower ability levels, gave a decidedly significant difference in favor of the large classes. The sum of the results of the three tests when reduced to standard scores gave a decided advantage to the large classes that could scarcely be attributed to the operation of chance factors.

TABLE VI

SUMMARY OF THE MEANS OF THE DIFFERENCES AND THE PROBABLE ERROR RATIOS BETWEEN THE SCORES OF THE STUDENTS IN THE SMALL CLASSES OF 1933-1934 AND THAT OF THEIR MATES CHOSEN FROM THE LARGE CLASSES OF 1935-1936 ON THE DIFFERENT ABILITY LEVELS

Test	Mean of Diff.	PE$_D$	Mean$_D$ / PE$_D$	Chances in 100
I. Small classes of 1933-34 compared with the large classes of 1935-36 on the upper ability level				
First Semester Examination*	—4.15	2.45	—1.70	87.0-L
Second Semester Examination	—27.36	2.61	—10.49	99.9-L
C. R. B. English Test	—17.02	2.92	—5.84	99.9-L
Total**	—9.33	1.17	—7.96	99.9-L
II. Small classes of 1933-34 compared with the large classes of 1935-36 on the middle ability level				
First Semester Examination	—17.00	2.44	—6.98	99.9-L
Second Semester Examination	—36.14	3.18	—11.38	99.9-L
C. R. B. English Test	—94.59	3.68	—25.70	99.9-L
Total	—18.00	1.41	—15.77	99.9-L
III. Small classes of 1933-34 compared with the large classes of 1935-36 on the lower ability level				
First Semester Examination	—1.24	2.69	—0.46	62.0-L
Second Semester Examination	—16.04	2.96	—5.41	99.9-L
C. R. B. English Test	—20.69	2.66	—7.78	99.9-L
Total	—4.19	0.89	—4.70	99.9-L

* The difference between the final score and the initial score of the student in the 1935-36 large class was subtracted from that of his mate in the 1933-34 small class. The negative sign thus indicates that the difference is in favor of the 1935-36 large classes.

** The scores on the different tests were combined in accordance with the method given by Hull and described by Henry E. Garrett, *Statistics in Psychology and Education* (New York: Longmans, Green and Company, 1926), pp. 281-284.

Large classes 1933-34 vs. large classes 1935-36.—Again this year, as in the preceding year, the students in the one large class of each teacher in 1933-34 were paired with students selected from the large classes of 1935-36. The objective was to compare the achievement of the students in large classes with the teacher handling a normal pupil-period load, with students in large classes when the teacher handled five large classes —the pupil-period loads in the two cases being in the ratio of three to five.

TABLE VII

SUMMARY OF THE MEANS OF THE SCORES ON THE OTIS CLASSIFICATION TEST, THE COLUMBIA RESEARCH BUREAU ENGLISH TEST, PREVIOUS GRADE POINTS, AND CHRONOLOGICAL AGE OF THE PAIRED STUDENTS IN THE LARGE CLASS OF 1933-34 AND THE LARGE CLASSES OF 1935-36

Group	Ability Level	Otis Test	C.R.B. English Test	Previous Grade Points	Chronological Age
Large, 33-34	Upper	148.59	134.50	42.58	15.94
Large, 35-36	Upper	152.18	127.78	44.41	16.00
Large, 33-34	Middle	134.12	109.91	36.16	16.20
Large, 35-36	Middle	126.78	94.32	35.53	16.61
Large, 33-34	Lower	111.86	92.88	31.97	16.37
Large, 35-36	Lower	110.58	72.63	29.91	16.79

Table VII shows the pairing of the large classes of 1933-34 with the students selected from the large classes of 1935-36. Here again it was possible to pair the groups very closely on all criteria except the groups on the middle and lower ability levels on the scores of the Columbia Research Bureau English Test. This was the same situation as was noted in the preceding year. Just why the classes in 1933-34 made a higher score on the English test used in pairing than did the students of 1934-35 or those of 1935-36 could not be definitely ascertained. One possible explanation, which seems plausible, is that the test in 1933-34 was given in May, 1933 just prior to the summer vacation, while in the two succeeding years it was given on the eighth day following the opening of school. All other tests given for the purpose of measuring achievement were given on the same corresponding dates of the year. Consequently any period of rapid re-learning following the summer vacation would not affect the comparative results of these measures of achievement.

The comparison of the results of the first semester examination of the large classes of 1933-34 and the students from the 1935-36 large classes with whom they were mated are given in Table VIII. Inspection of the data presented in this table shows that on all tests students of the 1935-36 large classes on the upper and middle ability levels did significantly better than did the large classes of 1933-34 taught by the same teachers. On the lower ability level only one of the three tests, the Columbia Research Bureau English Test, gave a significant difference in favor of the 1935-36 classes. The first semester examination gave a slight advantage to the 1933-34 class, while the second semester examination indicated that the students of the 1935-36 large classes had slightly excelled their mates in the large classes of 1933-34, but in both these cases the difference might be attributed to chance factors. The sum of the three tests on the lower

TABLE VIII

SUMMARY OF THE MEANS OF THE DIFFERENCES AND THE PROBABLE ERROR RATIOS BETWEEN THE SCORES OF THE STUDENTS IN THE LARGE CLASSES OF 1933-1934 AND THAT OF THEIR MATES CHOSEN FROM THE LARGE CLASSES OF 1935-1936 ON THE DIFFERENT ABILITY LEVELS

Test	Mean of Diff.	PE_D	$\frac{Mean_D}{PE_D}$	Chances in 100
I. Large classes of 1933-34 compared with the large classes of 1935-36 on the upper ability level				
First Semester Examination*	—12.32	2.58	—4.77	99.9-(35-36)
Second Semester Examination	—33.18	2.50	—13.25	99.9-(35-36)
C. R. B. English Test	—22.42	3.54	—6.34	99.9-(35-36)
Total**	—13.67	1.03	—13.33	99.9-(35-36)
II. Large classes of 1933-34 compared with the large classes of 1935-36 on the middle ability level				
First Semester Examination	—15.62	2.36	—6.62	99.9-(35-36)
Second Semester Examination	—13.74	2.80	—4.91	99.9-(35-36)
C. R. B. English Test	—67.01	3.74	—17.91	99.9-(35-36)
Total	—13.07	1.16	—11.26	99.9-(35-36)
III. Large classes of 1933-34 compared with the large classes of 1935-36 on the lower ability level				
First Semester Examination	1.80	3.40	0.53	64.0-(33-34)
Second Semester Examination	—4.08	2.97	—1.38	83.0-(35-36)
C. R. B. English Test	—20.00	3.18	—6.30	99.9-(35-36)
Total	—4.08	1.39	—2.93	97.6-(35-36)

*The difference between the final score and the initial score of the student in the 1934-35 large class was subtracted from that of his mate in the 1933-34 large class. The negative sign thus indicates that the difference is in favor of the 1935-36 large classes.

**The scores on the different tests were combined in accordance with the method given by Hull and described by Henry E. Garrett, *Statistics in Psychology and Education* (New York: Longmans, Green and Company, 1926), pp. 281-284.

ability level favored the large classes of 1935-36, but the difference was too small to be entirely significant. In considering the results of these tests it will be recalled that in 1934-35 and 1935-36 the teachers were handling five large classes, while in 1933-34 they taught only one large and three small classes.

Conclusions.—Since only three teachers, one subject and one grade level were involved in this investigation complete generalizations cannot be drawn from the findings. In drawing any conclusions from the study one must keep these limitations clearly in mind. The data presented seem to warrant the following conclusions in regard to English on the eleventh grade level.

1. Teacher A in this investigation, when supplied with the services of a one-third time stenographer, was able to teach five large classes of students of the upper ability as effectively as she was able to teach small classes when achievement was measured by standardized and other objective tests.

2. Teacher A improved in her ability to handle large classes as evidenced by the fact that her large classes in 1935-36 did significantly better than did her large class in 1933-34.

3. The five large classes on the middle ability level under Teacher B did significantly better than did her small classes.

4. The students on the middle ability level did equally well in large classes when Teacher B handled five large classes as they did in a large class when she taught only one large and three small ones.

5. The five large classes on the lower ability level under Teacher C did slightly better than did the small classes, though this difference might possibly be attributed to the operation of chance factors.

6. Students of the lower ability level taught in large classes by Teacher C did equally as well when she taught five larger classes as when she taught one larger and three small classes.

7. The results of this investigation casts some doubt on the advisability of the prevailing practice of sectioning students of the lower ability level into smaller classes than students of the upper and middle ability level.

8. The teachers of the middle and lower ability groups in this investigation at the end of the first year expressed an earnest desire to continue handling large classes with the assistance of a competent stenographer assigned to three teachers. The teacher of the upper ability group expressed a desire to continue the investigation but was not so enthusiastic as the other two.

9. No attempt was made during the years 1934-35 and 1935-36 to measure student attitudes developed in the large classes. The attempt to measure these attitudes in 1933-34 indicated that the development of desirable attitudes on the part of students was not dependent upon the size of class.

10. Since some teachers, at least, can handle large classes as effectively as small classes it becomes the responsibility of the school administrator to determine which of his teachers can teach large classes effectively and in what subjects and on what ability levels.

ON ART APPRECIATION OF CHILDREN:

I. PREFERENCE OF PICTURE SUBJECTS IN GENERAL

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INTRODUCTION

THIS study was undertaken as part of an investigation into the creative and appreciative art abilities of children.[1]

The problem of art appreciation for children and by children is a difficult and deceiving one. Two phases of this problem present themselves: When do children start to appreciate art at all, and of what kind is this appreciation? The question which interested us mainly, because of our investigations into art abilities of children now under way, was the comparison of 11 to 16 year olds with a group of specially gifted children of the same age levels. The first group will be referred to in this report as the average group, the word average referring in this case *only* to their ability in drawing. The second group will be designated as the Specials. We therefore also raised the question of how the appreciation of specially gifted children is related to their own productive activities and abilities?

Previous investigations seem to point to art—pictures, architecture and sculpture—as being the very last of the things enjoyed by children between seven and thirteen.[2] Art objects, however, as well as crafts and ornamented man-made things, seem to be in high favor. Other investigations have sought to answer problems such as the actual picture preference of children[3,4,5,6] and this preference as compared to the pictures

[1] I am indebted to Dr. Munro, Curator of Education of The Cleveland Museum of Art, for his continuous help and interest and valuable discussions. This work was carried out under a grant of the General Education Board, New York, to the Educational Department of The Cleveland Museum of Art, for the investigation of the nature and growth of artistic abilities of children as proposed by Dr. Thomas Munro.

[2] Barnes, Earl. *The Prettiest Thing.* Studies in Education (Stanford), Vol. II, 5, 1902, 180-194.

[3] Berliner, A. "Aesthetic Judgment of School Children," *Journal of Applied Psychology,* II, 1918.

[4] William, F. "Investigation of Children's Preferences for Pictures," *Elementary School Journal,* XXV (October, 1924), 119-26.

[5] Grzegorzewska, M. "Enquete sur les gouts Esthetiques de la Jeunesse Scolaire," *Journal de Psychology,* XII (1915), 511-524.

[6] White, R., and Johnson, B. "Children's Choices in Modern Art," *Child Development,* I (1930), 347-349.

selected by adults for children's use,[7] the childhood preferences as recalled by adults,[8] the type of pictures children are interested in,[9] the color preference as related to the picture choice[10] and the measurement of native ability to appreciate art.[11]

This study is a part of a more comprehensive investigation on the art preferences of children, extending to as many art objects and in as many directions as possible, and always in relation to the preference of specially gifted children. This was made possible and the validity of the results enhanced by recording the reactions of the large number of children who come every Saturday to the Cleveland Museum supplemented by small groups of children from Cleveland schools aided by the variety of material—good sized and fairly clear prints—which the museum is able to offer.

THE PROBLEM

In order to understand creative abilities we also have to investigate appreciative abilities. The latter involve preference of pictures and the reasons for such preferences. We therefore set out to investigate the point of view from which children look at pictures and what determines their preference and choice. In approaching this problem we decided to find the answer to the following questions. Is the dominating factor in the children's judgment the subject presented in the picture and if so in which way? To what extent is their judgment determined by design in the picture, by colors, lines or arrangement? Is their judgment influenced by purely personal interests which the picture seems to represent or suggest according to their age and sex? Will their choice be scattered so that in the end a nearly uniform distribution of votes will be obtained? If there is a distinct preference for one or another of a set of pictures will such preference be the same for both sexes and through different age levels? What is the relation of the preferences of the average group to that of the Special group and what reasons do they

[7] Waymack, E., and Hendrickson, G. "Children's Reactions as a Basis for Teaching Picture Appreciation," *Elementary School Journal*, XXXIII (February, 1932), 268-78.

[8] Sargent, Walter. *Report of Picture Questionnaire*, Department of Art Education, Chicago, 1923 (unpublished).

[9] Morrison, J. G. *Children's Preferences for Pictures Commonly Used in Art Appreciation Courses*, University of Chicago Press, 1935.

[10] Mellinger, B. E., *Children's Interest in Pictures*, Coll. Contr. Educ., 1932, No. 51.

[11] Christensen, E. O., and Karwoski, I. *A Test in Art Appreciation, Art Psychology Bulletin* No. 3, 1925.

offer? Problem summary: What subjects do children prefer in pictures? What are the reasons for their choice? How do average and specially gifted children compare?

THE EXPERIMENT

Tests were made on 461 children, aged 6 to 16. The 16 year old group contained a few older children. The same test presented in the same form was given to a group of 72 specially gifted children, aged 11 to 16. The Specials work in a group by themselves and are made up of children with an apparently greater creative ability in drawing than the average. There were 227 boys and 234 girls in the average group, (each age level made up of about 20 girls and 20 boys) and 34 boys and 38 girls in the special group.

Seventy pictures, chosen as uniformly as we could find them, with respect to style and period and representing 11 different subjects were put up for choice. The best preferred picture of each group, chosen in a preliminary test by two children, a boy and a girl, of each age level, constituted the pictures for the experiment. As we were unable to find any adventure picture we inserted an additional picture, 7a, an illustration by Wyeth, for Stevenson's "Black Arrow" to satisfy the demands of the boys.

These twelve pictures were placed in a row, numbered and shown to small groups of children at a time, so as to be able to watch their individual reactions. Every child made its first, second, third or more choices if it so desired, or none if none of the pictures appealed to it. The experimenter took the answers of the younger children (up to 12 years) while the older children wrote their own answers. The group of Specials, accustomed to discussing pictures, were especially instructed that their choice meant their preference for the picture they enjoyed and liked most and not a grading of the picture as to its artistic value.

The following pictures were used in the experiment:

1. Denis Etcheverry: Portrait in Pink.
2. Henri Fantin-Latour: Tannhaeuser.
3. Hans Thoma: Dancing in a Ring.
4. W. Bouguereau: The Bathers.
5. Carl Hofer: Muzzano.
6. C. Corot: Evening.
7. Jules Bastien-Lepage: Joan of Arc.

7a. N. C. Wyeth, illustration from The Black Arrow by Stevenson. ("The little cockle dipped into the swell . . . ")
8. Bruno Liljefors: Swans.
9. Gustave Courbet: Apples.
10. Auguste Renoir: Flowers.
11. Henri Le Sidaner: The Dessert (Interior).

Below are two of the picture groups out of which one picture was chosen for the experiment:

Story pictures:

Edw. Abbey: King Lear.
Bastien Lepage: Joan of Arc.....25 percent votes.
George Boughton: Puritans Going to Church.
Walter Crane: Rape of Persephone.
Herbert Herkomer: Emigrants.
Jean Laurens: Excommunication of Robert the Pious.....no votes.
John Millais: The Vision.....no votes.
Puvis de Chavannes: Beheading of John the Baptist.
Charles Ricketts: Salome.
Byam Shaw: This is the Breast the Queen Leant on
Hans Thoma: Spring Idyll.

Pictures with groups of adult figures:

Aman-Jean: Day Dreams.....no votes.
Carl Bantzer: Hessian Peasant Dance.
Henri Fantin Latour: Tannhaeuser.....20 percent votes.
Ludwig v. Hoffman: Surf Riders.
Jules Bastien Lepage: May Harvest.....no votes.
Carl Larsson: Halsa Vackert.
Max Liebermann: In the Preserve Factory.
Alex Lunois: Turkish Women.
Edouard Manet: The Boat.
Pierre Renoir: Bathing in the Seine.

The following questionnaire was used:

Here are 12 pictures; look at them carefully and pick out those you like. Write down the number of the picture you like

best .....
next best .....
third choice .....

Write here if there are any other choices, write the number .....

1. Why do you like No..... best?
   Explain as well as you can.

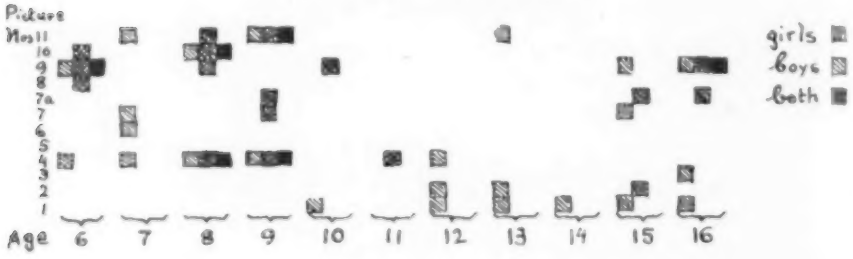
TABLE I

SHOWING PICTURE PREFERRED (NUMBER INDICATES PREFERRED PICTURE) BY BOYS AND BY GIRLS ONLY AND THOSE WHICH ARE SUPPORTED BY BOTH BOYS AND GIRLS

(Age)	Legend: Girls choice *; Boys choice †; Choice both boys and girls—Number only.										
6	1*			5	6*		7a†	8†			
7	1*	3*		5				8†			
8	1*				6†		7a†	8			
9		3*					7a†	8	10*		
10				5			7a†	8	10*	11	
11		3						8			
12		3			6		7a	8	10		
13				5		7	7a†	8†			
14			4	5	6			8	10*		
15				5*	6			8			
16				5	6			8			

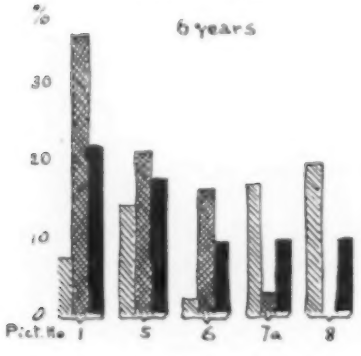
GRAPH I

PICTURES NOT VOTED UPON



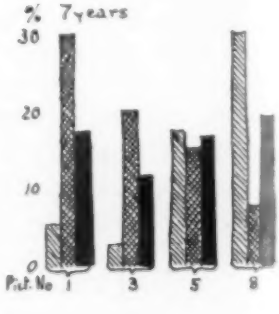
GRAPH II

6 YEARS OLD



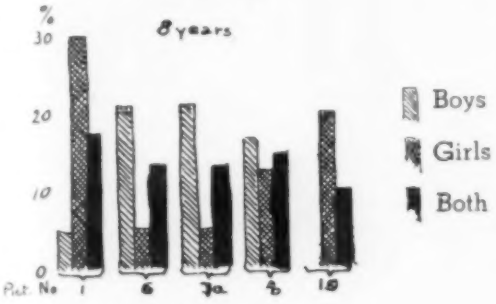
GRAPH III

7 YEARS OLD

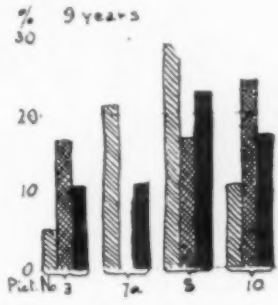


2. Do you like this picture because it makes you think
   of a story
   of a place
   of people
   of things

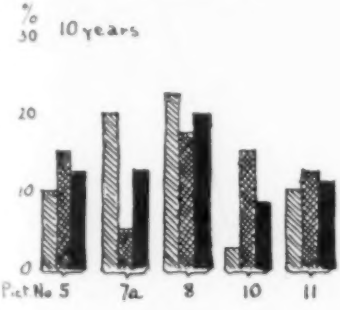
GRAPH IV
8 YEARS OLD



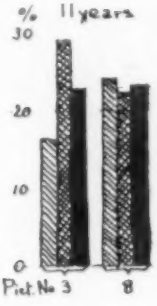
GRAPH V
9 YEARS OLD



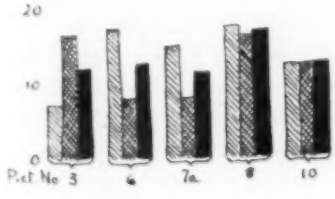
GRAPH VI
10 YEARS OLD



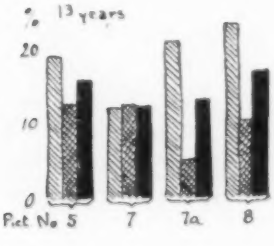
GRAPH VII
11 YEARS OLD



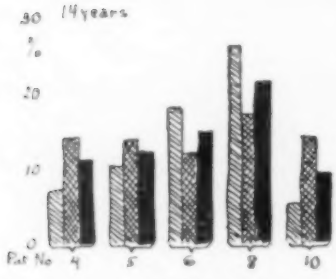
GRAPH VIII
12 YEARS OLD



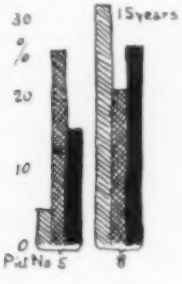
GRAPH IX
13 YEARS OLD



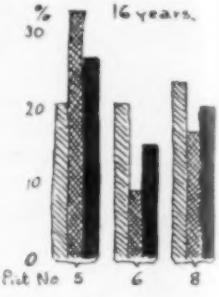
GRAPH X
14 YEARS OLD



GRAPH XI
15 YEARS OLD



GRAPH XII
16 YEARS OLD, A. O.



of the colors
or do you like it because of something else?

3. Would you like to hang this picture in your house?
4. If you were an artist would you paint this kind of picture?
5. Is there anything in this picture that you would like to be different?

Test summary: 461 children between the age of 6 and 16, and 72 specially gifted children were tested to determine their choice of a picture out of a group of 12 pictures, representing 12 different subjects. A questionnaire to investigate the reasons for their choice was answered. The children were tested in small groups so as to give them individual attention.

THE RESULTS

A. Choice of picture.

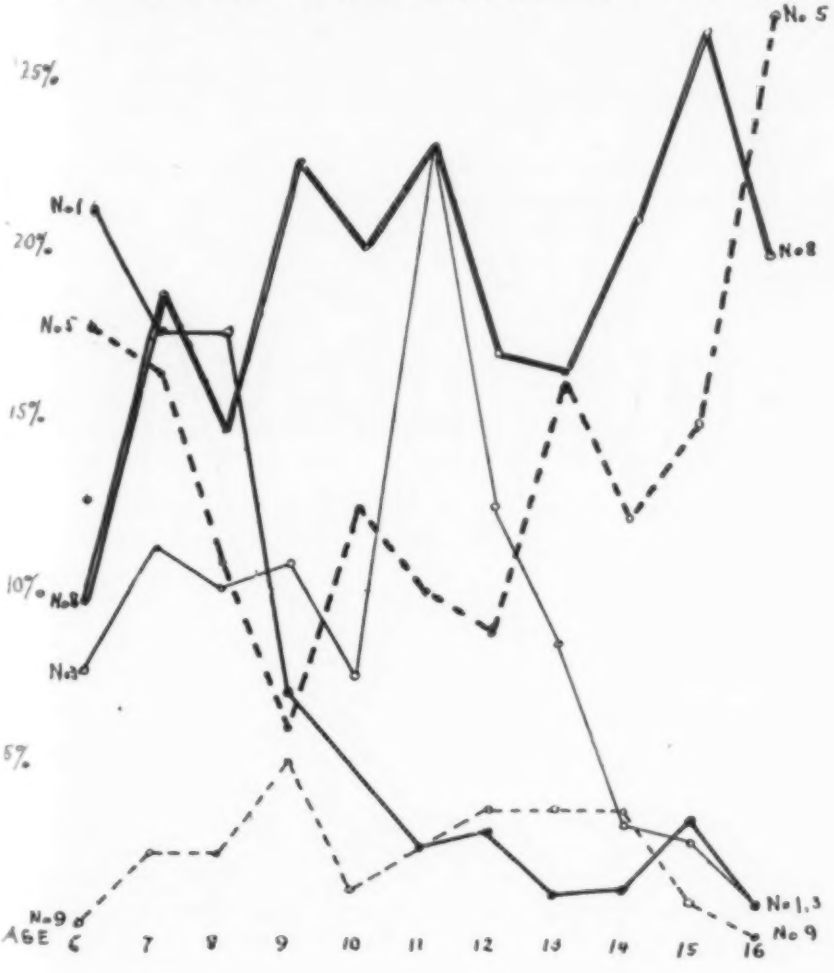
The results show that a certain number of pictures are entirely or almost entirely ignored. They further show a strong dominance in choice for small groups of 2, 3, or 4 pictures. They also show a break in votes from the group of preferred to non-preferred ones which is very sharp, usually a drop of 50 percent. The following pictures are the preferred ones:

Computations were made by following not only the first choice but by taking into account the first and second choices. We noticed that most children cannot make up their mind as to which of two pictures they should give a decided preference. A few repeat tests which happened accidentally showed that this conclusion was right because the first and second choice in the two questionnaires were interchanged.

In going over the list of pictures we notice that some of them, such as No. 9 are almost entirely ignored. Others are dropped at certain age levels. No. 11 is of no interest to the 6, 7, 8, or 9 year olds, nor is No. 2. No. 4 is not included until we reach the age of 14 where it suddenly gets a fair percentage of votes. Nos. 6 and 7 get scattered votes up to the age of 11 and then attract more interest, especially No. 6. There is some interest for No. 10 between the age of 11 and 14.

GRAPH XIII

PREFERENCE CURVES OF THE PICTURES No. 1, 3, 5, 8 AS COMPARED TO THE No. 9



The interest and majority of votes centers on 3, 5, 7a and 8. No. 8 is never dropped in preference throughout all age levels and holds first place for 8 age levels. No. 1 carries vast majority of votes through the ages 6, 7, 8, supported almost entirely by girl's votes. It is curious to see how few girls vote for this picture from the age of 9 on; no boy older than 9 votes for it at all. No. 7a shows the opposite curve; it is almost entirely supported by boys. Graphs II-XII give the groups of preferred pictures for each age level.

In following the preference of some of these chosen pictures we see clearly that the interest rises at certain ages and dies out at others. Graph XIII shows No. 1 losing votes rapidly with increasing age levels, No. 5 increasing its votes steadily from the age of 9 on, while No. 3 has a sharp peak at the age of 11 but receives few votes through all the other age levels.

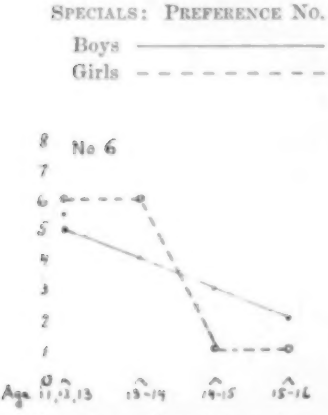
Only two boys (6 years old) refused to make a choice, explaining that none of the pictures showed trains, airplanes or big ships.

The picture preferences of the specials were Nos. 8, 5, 4, 6, quoted in order of preference. These four pictures make up more than 60 percent of all votes, the remaining 39 percent being scattered over the other 8 pictures.

The following graphs show the preference curves of Nos. 6 and 4 through overlapping age levels.

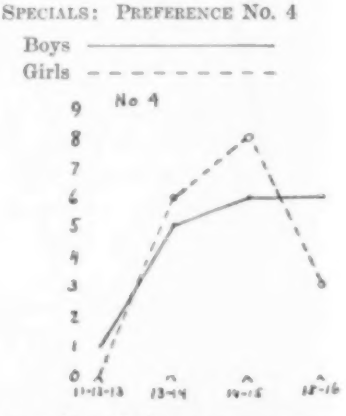
GRAPH XIV

SPECIALS: PREFERENCE No. 6



GRAPH XV

SPECIALS: PREFERENCE No. 4

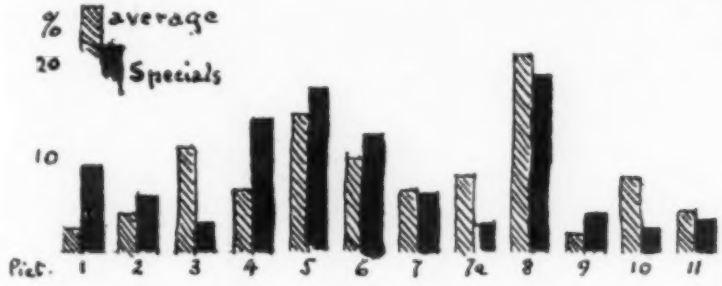


In comparing the outcome of preference votes of the average group of 11-16 year olds and the special group of the same age, the following two graphs show clearly that there is no difference in votes as to picture

choice as compared by age levels and only a slight difference in some pictures for the total of all tested children of these groups.

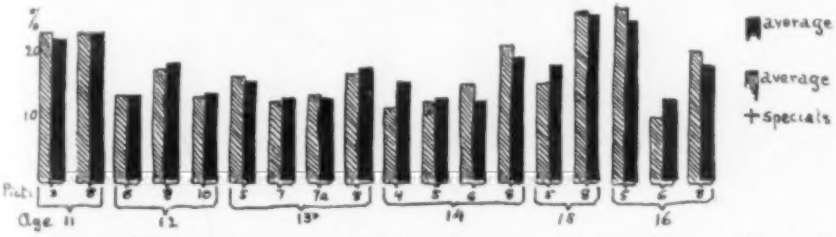
GRAPH XVI

COMPARING THE TOTAL VOTES OF ALL 11-16 YEAR OLDS WITH ALL THE SPECIALS



GRAPH XVII

COMPARING THE PREFERRED PICTURES VOTES OF THE 11-16 YEAR OLDS AVERAGE WITH THE SAME GROUP INCLUDING THE SPECIALS



Summarizing we may say that with respect to preference there is a sharp difference between the choice of the girls and boys, that one picture owes its majority of votes to boys while another owes it to girls (see graphs 2, 3, 4). This difference fades out with growing age, especially for the age levels 14, 15, 16. The choices of the 15 year old girls compare with those of the 16 year old boys.

B. Answers to the questionnaire.

The answers on the questionnaire may be grouped in different ways and evaluated accordingly.

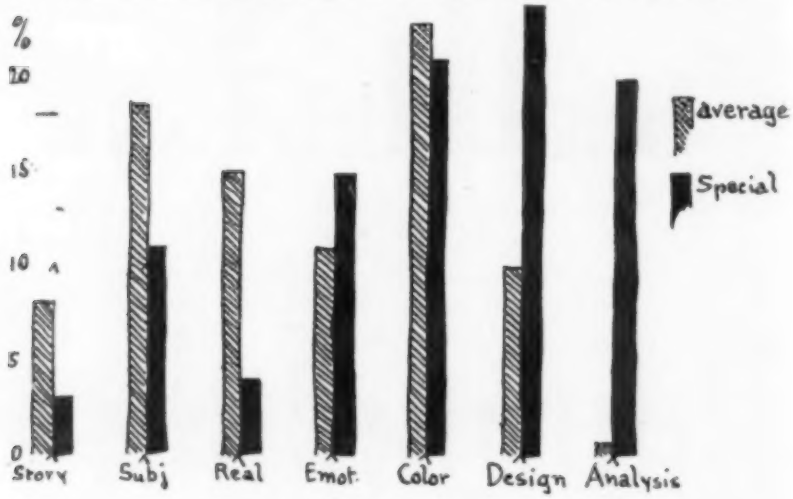
Question 1: "Why do you like No..... best?" yields individual answers which may be classified under the following headings: (1) The picture reminds them of a story, adventure, play or equivalent content. (2) Some or all of the objects in the picture are of interest. (3) The picture is "real, realistic, natural, lifelike." (4) The reaction is emotional

or purely imaginative. (5) The colors, distribution of light and shade, attract them most. (6) The design, including composition and technique, determines their choice. (7) The comment made is of a sort which includes an analysis of the technique and conception of the picture. This analysis is in a few cases definite, in others only vaguely implied.

GRAPH XVIII

QUESTION 1: REASONS FOR PREFERENCE

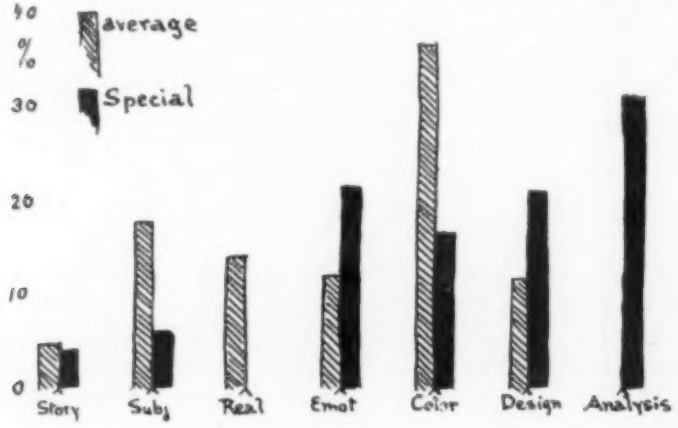
COMPARISON OF THE ANSWERS OF THE SPECIALS AND AVERAGE GROUP



GRAPH XIX

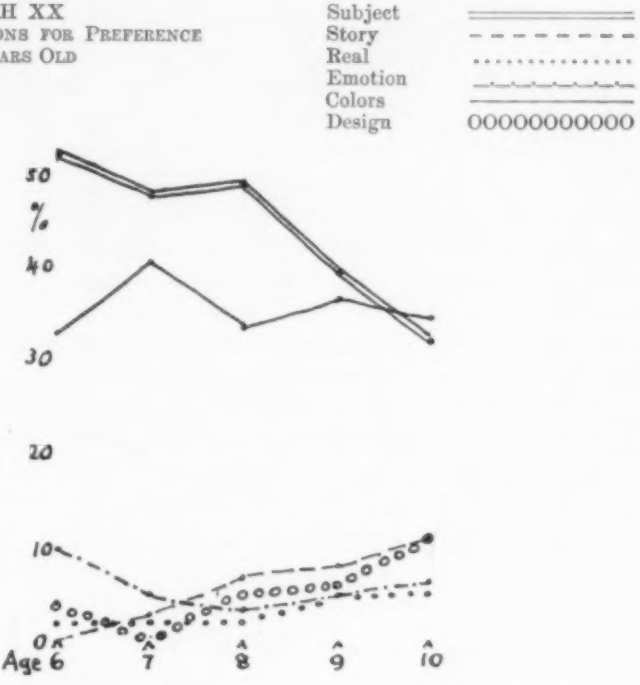
QUESTION 1: REASONS FOR PREFERENCE

COMPARISON OF THE ANSWERS OF THE 15-16 YEARS OLD, SPECIALS AND AVERAGE



The results of the answers to question 1 are tabulated in graphs 18, 19, 20 and show definitely that with the 6 to 10 year olds the content of the picture, *i. e.*, its subject together with the colors determine the preference.

GRAPH XX
QUESTION 1: REASONS FOR PREFERENCE
6-10 YEARS OLD



For the 11-16 year olds of the average group in order of importance the subject, the reality in the presentation and the color quality are the determining factors. The Specials, however, are very definitely influenced by the design which rates highest and only next by the color. The analysis of the picture seems to be of primary importance to them, a factor which does not rate at all with the average group. Reality and story quality of the picture are not reasons for preference with the majority of the special group. The answers to Question 1 show an outstanding difference between the average and special groups.

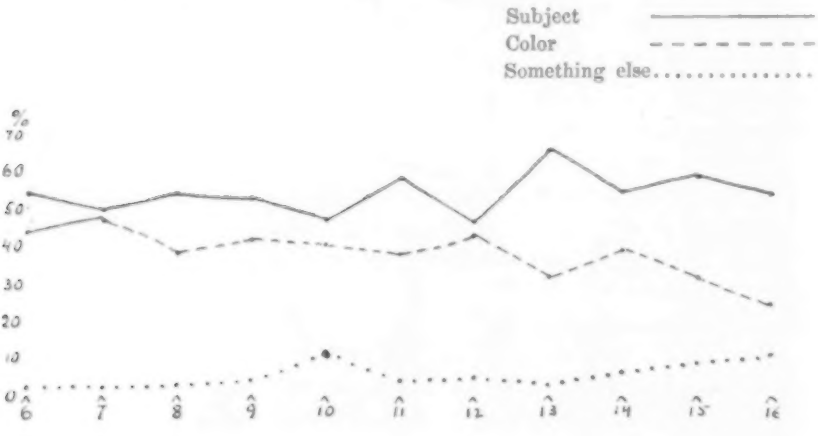
Question 2: Do you like this picture because it makes you think of a story, of a place, of people, of things, of the colors, or do you like it because of something else? contains 6 different points which again may

be grouped in a similar manner. References to story, place, people, things, involve the actual subject of the picture or the subject associations directly or indirectly evoked. Individual remarks added by some children indicate clearly this understanding. Definite stories or stories similar to the subject of the picture are sometimes named. Places are referred to by name. "Things" quite often mean the subject such as the birds in picture 8 or the apples in No. 9. People are quoted by name or referred to as "reminds me of my friend," "reminds me of a girl in class." Story, place, people, things, all refer to and include the subject of the picture itself and therefore were computed under one heading subject. Color, which has nothing to do with the subject matter was computed separately. The answers to "or do you like it because of something else" were mostly of a personal and emotional nature and therefore were computed separately. Often two or three of these points are checked, all uniting in the preference of the picture. The number of answers was therefore different from the number of children tested and the results were computed according to the number of answers.

Subject matter is given as the reason for the choice of a picture in 47 to 65 percent of the cases. Color, as a reason for preference, runs from 31 to 47 percent. Few of the children checked on "something else" but these checks become more frequent with higher age levels and reach 10½ percent with the 16 year olds.

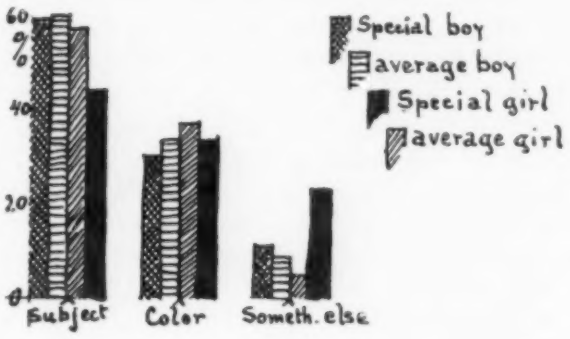
GRAPH XXI

ANSWERS TO QUESTION 2: BOYS AND GIRLS, AGES 6-16



GRAPH XXII

ANSWERS TO QUESTION 2: COMPARISON OF ANSWERS OF AVERAGE AND SPECIAL GROUP



The special group shows a lower rate in answers as to subject and a higher one as to "something else" compared to the average group.

Question 3 "Would you like to hang this picture in your house" was answered emphatically in the affirmative by the average group with a ratio of yes/no of 7.6, while the ratio of the answers of the Specials is only 3.1.

Question 4 "If you were an artist would you paint this kind of picture?" also finds a strongly affirmative answer by the average group. Their ratio of yes/no is 4.5 as compared to 2.6 of the Specials.

Question 5 "Is there anything in this picture you would like to be different?" shows a difference in the answers of various age levels with a drop in "yes" as the child grows older. The younger children tend to suggest object changes in the picture as well as some changes in color or shading. The 11 to 16 year olds advance suggestions which are tabulated below:

TABLE II

ANSWERS TO QUESTION 5: 11 TO 16 YEARS OLD AVERAGE GROUP
THE NUMBERS IN THE TABLE REFER TO PERCENTAGE OF ANSWERS SUGGESTING CHANGES IN THE PICTURE

Age level	objects	action	colors shading	emotion imagin.	contrast clearness	design
11, 12, 13	52	1	20	12	10	6
14 to 15	35	2½	38½	6	18	—
15 to 16	32½	—	39	8	20	—
11 to 16	40	1	32½	8½	16	2

The changes suggested by the Specials are too few to be computed. Only 21 changes are suggested. Of these 9 are for changes in color and shading, 4 for greater contrast and clearness, 5 for a change of object and 2 for a change in design. The small number of suggestions offered do not allow a fair comparison with the average group; however, the majority of answers of the Specials show that they are not much interested in object changes.

Summary of answers to questionnaire: The reasons determining the picture choice of the 6-10 year olds center on the subject (content) of the picture and its colors. There is a very marked difference between the average and the special groups of the ages 11 to 16. Whereas the average group prefers on the whole the subject itself, the reality in presentation and the colors, the Specials are influenced in their choice by the design, the color and by their own analysis of the picture. The Specials proffer more "intangible" reasons of an emotional or imaginary character than the average group. As to the point of owning their favorite picture and seeing it hanging in their house the percentage of the average group voting "yes" was twice as high as that of the Specials; the same rate extends to the questions of influence of the chosen picture on their own drawing subjects. As far as changes are concerned the Specials are inclined to make fewer suggestions than the average group and they differ in the quality of their suggestions.

INTERPRETATION OF RESULTS AND CONCLUSIONS

The results obtained in this experiment show definitely that certain kinds of pictures are of interest to children, while others are of no interest at all. Pictures, such as still lives, and interiors, are of little interest to all ages between 6 and 16. The preference in other pictures shows a definite difference as to age levels and sex.

The choice of picture and the reasons given in the questionnaire for this choice most definitely point to the content or subject of the picture as the determining factor. In classifying the results as to age levels we can see the connection between picture choice and general interests at these age levels. These age levels can be grouped according to the results obtained in the following manner: Pictures 1 and 5; 1, 5, and 8; 1 and 8 are, on the whole, the preferred ones of the age levels 6, 7, and 8. Picture 1 suddenly drops entirely in interest after this age. (See graph XIII.) However, if we had tested a group of boys only as to interest

in picture 1 the curve would always have maintained its low level. On the other hand, by testing a group of girls only of these age levels, the pictures Nos. 7a and 8 would have had to be discarded as of little interest. (See graphs II, III, IV.) In scanning the reasons for preference given for picture 1 we find a good number indicating specifically subject such as the clothes worn by the portrayed person, while others list color and brightness. The same type of answer is given by the boys for their choice in relation to Nos. 7a and 8. We also find a large number of answers stating directly that they like boats, birds, and water and therefore pictures depicting these. However, they also mention color, light, etc. This indicates that the subject itself takes first place, that color, brightness, light, help but do not contribute so much in making the final choice. The group of 9 and 10 year olds still show a difference in sex as to preferred pictures (see graphs V, VI), but not as definite as in the previous age levels. The sharp difference of the early age levels lessens and almost dies out at the ages 14, 15, 16. (See Table I.) The adventure picture, 7a, is kept prominent in the choices of boys throughout. The 12 year old girls only share this taste for adventure. The meaning of this sex difference in choice by same age levels clearly shows a strong difference in interests during this period. It also reflects on subjects which are of particular interest during these grades and the difficulty of keeping boys' and girls' interest alive in the same subject matters. For art appreciation in these grades are conciliation in the matter of the subject chosen is rather difficult to effect. It would mean at best that an alternation in choice to satisfy both sexes or a splitting of the class in boys and girls as far as art appreciation is concerned might be more satisfactory. No. 8, the picture kept in preference throughout all age levels owes this position for the first two age levels entirely to the boys. From then on the preference is due to both, boys and girls, although always more to the boys. No. 8—Swans—portrays birdlife, wild life. It also shows the sea and an immense expanse of sky in the evening light. The reasons proffered for the choice of this picture are of the same kind for both sexes. At the lower age levels the bird subject is stressed more while at higher age levels the scenery part in the picture is the more determining. The combination shows a strong interest in nature as such and the repeated comments on the reality and naturalness of the painting strengthen this impression.

Just as the choice of pictures indicates plainly the things around which interest centers at different age levels, the reasons given for the

choice show that aesthetic elements are only crudely present. The preferred picture tells most about the things the child likes and wants to know, the associations these interests evoke and the imaginings stirred by the picture. The design in the picture, the structure of it, the effect achieved, count apparently only insofar as they accentuate the interesting subject. *This also holds true for the average children above the age of ten.*

Not so with the children who are specially gifted for drawing. Here quite a different element enters. The pictures chosen are nearly the same as those picked by the average children of the same age levels (see graphs XVI, XVII). The noticeable difference in choice of No. 3 is due to the fact that the group of 11 year old Specials is very small, the 11 year old average group very large and No. 3 has a peak in preference at this age level (graph XIII). The difference in choice of No. 4 may be interpreted as due to the interest in nudes aroused through drawing figures after models and the special training of this group. The reasons given by the Specials are of quite a different nature. The interest in the subject is doubtless dominating, but their attitude toward the picture is very different. In comparing the reasons given for preference we notice that the children of the average group estimate the attraction of the story of the picture twice as highly as do the Specials. The averages think highly of the subject as such, place enormous importance on the reality of the presentation, of which facts the Specials think little, and they appreciate the design only to a small extent while the Specials rate design high in importance. But besides all the differences in reasoning just mentioned the Specials look at pictures with an eye for certain effects which the average child does not seem to observe. The special child discovers in the picture something he wants to know for his own creative work, something which may help him to achieve more in his own drawings. The picture, to the special child, is not only a source of pleasure and enjoyment but something very useful. According to his interest the special child detects in the picture traits, solutions, qualities, which he is striving to achieve but which he finds difficult to do of his own accord. In short, the special child *learns* through the picture and consciously or unconsciously looks at the picture with this desire to learn in mind. (See graphs XVIII, XIX, and XXII.)

A difference in discrimination is observed when looking through the answers to questions 3 and 4. Both groups want to possess the picture they like but the average group does almost twice as much as the

Specials. The difference in attitude shows—and this is supported by written and spoken comments—that the Specials make a difference between the liking of a picture as such and the constant view of this picture or the appropriateness of their home surrounding for such a picture. Their point of view is wider and contains distinctly an aesthetic element. Question 4 is answered by the average group in such a way as to show that contemplation of a picture and the making of a picture (even in imagination) are the same, which means that the subject preferred in a picture is more or less identical with the choice of subjects for a picture of the child's own making. The Specials on the contrary seem to draw a line between the contemplative liking of a picture and the real making of one. They seem to feel their possible inability to create for themselves the kind of painting they have chosen or their greater ability to paint a subject different from the one in the picture before them, even though their subject would not be as attractive.

The answers to question 5 as to change in the picture they have chosen show a large number of "yes" at the earlier age levels. There is less desire for change at the older age levels. As to the changes indicated the younger children almost all consider a change of one or another of the objects depicted. This desire to change tends to indicate a very vivid imagination. The child looks at the picture as a reality in which he moves and acts and tries such changes as he would attempt in a real situation of this kind. The 14-16 year olds desire more color changes and greater clearness or contrast and are less concerned about changing objects in the picture than the younger age levels. Their attitude shows less of an identification of themselves with the situation described in the picture and more of the attitude of the unconcerned and objective spectator. In contrast to the average group the desire for change in the picture by the Specials is small. These few Specials do not ask for changes of picture objects; their desire for alteration concerns quality of design and color. Their attitude can therefore be interpreted as nearer to the artists attitude and that of the trained adult.

The results in the picture choice and the answers connected show distinctly that we have to take into consideration the subjects which children prefer at different age levels when teaching art in general, history of art and art appreciation. This will not mean that we cannot overstep the limits drawn by the child's picture choice, but it certainly shows the child's center of interest and therefore the point where the

most successful attempt can be made to rouse interest and understanding. A large variety of pictures can be shown and discussed, yet our results indicate a main line from which one should not deviate too strongly and to which one should always return. Understanding can be best stimulated and cultivated by building it around the central and most vital interest of each age level.

Summarizing we may say that the preference of certain pictures is indicative of the main interest of the child, that certain age levels have specific strong interests which are of a quite different kind with girls than with boys at early ages and are rather similar for both at older age levels. The reasons proferred for the picture choices all point to complete dominance of the subject itself as the determining factor. Specially gifted children share the preference of the average group, that is they share their main interests. It must be borne in mind that the Specials were chosen here only as specially gifted in drawing and it is very likely that their process of growth and maturation is no different than that of the children in the average group. The attitude of the average child and the specially gifted child when contemplating a picture is apparently quite different. While the attitude of the average child is non-aesthetic or only crudely so, that of the special child is aesthetic to some extent and of an analytical quality. For the average child contemplating a picture is a stimulating enjoyment but with no particular purpose whereas for the specially able child it seems to be a means of learning. The definite choice of pictures at certain age levels indicates a main line to be followed by teachers of art appreciation or art history. The reasons given for the picture choices indicate the limits in aesthetic understanding with average groups of children and the possibilities, aesthetically and technically, with specially gifted children.

SUMMARY

This problem is part of an investigation into the creative and appreciative art abilities of children. Which pictures do children prefer? What determines their choice? How do average and specially gifted children compare as to choice and reasons given for this choice?

Four hundred sixty-one children, age 8 to 16, and 72 specially gifted children, age 11 to 16, were tested. Out of 70 pictures a group of 12 was chosen in a preliminary test by a small group of children. These pictures represented twelve different subjects. The children were requested to

make a first, second, third, etc., choice, if they so desired, or none if they did not like any of the pictures. A questionnaire to investigate the reasons for the picture choices was answered. The testing was done in small groups.

The preference shown is definite, a majority of the votes being concentrated on a very few pictures. There is a sharp difference in choice between those of boys and girls of an early age. This difference dies out with progressing age. Both the average as well as the special group show a preference for the same pictures according to age levels.

The reasons given for the picture choices center first on the subject (content) of the picture and second on the color qualities. There is a marked difference in the reasons offered by the average and the special groups. The average group centers on the subject itself, the reality in presentation and the colors. The Specials are influenced by the design and the color of the picture and the knowledge (through analysis) which they gather from it. The Specials proffer more reasons of an emotional and imaginery character than the average group. They are not as desirous to own their favorite picture or to want to paint just such a picture as is the average group. Compared to the average group few of the Specials offer suggestions for changes.

The choice of picture is indicative of strong interests at certain age levels which are of a different nature in boys and girls under the age of ten. These interests seem to be the same for the average and special group indicating a similar maturation process for both groups. The attitude in contemplating a picture and the reasons for the choices are of quite different nature for the average and special groups. Whereas the average child assumes a crudely aesthetic or a non-aesthetic attitude, the special child's viewpoint is aesthetic and analytical to some extent and the child consciously or unconsciously, seems to learn from the picture.

The choice of pictures indicates to the teacher the center of interest at different age levels and therefore the material most advantageous for art appreciation. The reasons given for the choices indicate the aesthetic understanding of both average and special groups.

EDITORIAL

FUNDAMENTALS OF RESEARCH—METHODOLOGY

In the May and June, 1931, issues of the *Journal of Educational Research* appeared a symposium on the classification of educational research to which eighteen persons contributed. Probably the chief contribution of this symposium was to reveal the diversity of the bases and categories employed in the classification of research and to urge the use of *method* as the fundamental basis for differentiating between investigational procedures. The symposium indicated that the points of view from which research has been classified include: the fields to which applied, purpose, place where conducted, application, data-gathering devices employed, character of the data collected, symbols employed, forms of thinking, control of factors, methods employed in establishing causal relationship, etc.

Since 1931 some progress has been made in the educational literature toward adopting *method* as the basis for classification and description of research procedures, although there are conspicuous exceptions to this statement. A book published in 1933 classifies investigational methodology in terms of the *purpose* for which research is conducted: descriptive, causal, evaluative, constructive, and integrative. These procedures really seem essential as phases of or steps in any sound investigation rather than as independent major methods of research. For example, an adequate study of visual education might include: a description of present status; causal factors leading to development of this field; evaluation of objectives, materials, or methods involved; application of findings to classroom situations and pertinent recommendations (constructive type); and an analysis of related studies (integrative type).

Another book, published in 1937, discusses methods of research under the following captions—descriptive, historical, experimental, philosophical, prognostic, curricular, sociological, and creative—which leaves much to be desired as a classification, in terms of consistency. Philosophy is concerned chiefly with values and interpretation rather than with collection of data. Prognosis is a purpose for which research is used rather than a method as such. The curriculum is an area of problems for research

and not an investigational method; there is just as good a claim for including administrative research, supervisory research, etc., in the research classification, if areas of problems are to be placed on the same level in the discussion with basic methods such as historical, survey, and experimental procedures. Sociology is a field, using virtually all the methods of investigation, rather than a method as such; there is almost as good a claim for including economic research, geographic research, etc., in the classification. With respect to "creative" research, one may use research as a foundation for or as a preliminary to the production of creative work such as prose, poetry, drama, musical composition, opera, dance form, picture, statue, or building, but the function of science and of scientific method is to reveal truth rather than to create as does the painter, novelist, poet, dramatist, musician, sculptor, or architect.

The point of this editorial is that, in terms of consistency and clarity, it seems far better to set up a basal classification of research methodology in terms of *scientific method*, and then to show under each major method (historical, survey, experimental, etc.) the application in various ways: in determining values philosophically, to predict, in curriculum making, in the field of sociology, as applied toward creative ends, etc. A classification based on method would include: historical, normative-survey, experimental, and certain other methods especially adapted to studying complex causal relationships. Statistics deals with ways of manipulating data, and makes its contribution in the classification, analysis, and summarization of data. Philosophy renders its service in the evaluation and interpretation of data, and in determining ultimate goals and values.

The question under consideration is far more than one of terminology; it concerns identification of the major approaches to the solution of educational problems. Unless those who write on research methods, those who teach courses in this area, and those who supervise educational investigations have a clear conception of the important characteristics of and essential differences between major methods of investigation, as well as the steps in research, it is too much to hope that the majority of field workers and graduate students will understand clearly and choose wisely the appropriate procedure for attacking a given problem.

CARTER V. GOOD

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

FORLANO, GEORGE. *School Learning with Various Methods of Practice and Rewards.* Contributions to Education No. 688. (New York: Bureau of Education, Teachers College, Columbia University, 1936), 114 pp. $1.60.

It is Forlano's belief that "To be of worth, principles of learning must not only be scientifically true but also effective under school conditions" (2-3). Further, he considers it imperative that they be subjected to "a systematic schoolroom check . . . as they issue from the laboratory" (101). With this orientation, he set out to test the classroom effectiveness of three principles of learning which had been developed in laboratory experiments. He studied: the effect of recitation during learning; the factor of reward vs. non-reward; and the factor of immediate vs. delayed knowledge of results. The principal results were:

1. "As the result of our experiments it may now be stated that in the case of school children in the fifth and sixth grades working under ordinary classroom conditions and with methods and materials common to the school, learning by recitation is clearly superior to learning by reading" (98).

2. Monetary rewards, whether given immediately or merely promised at the time of learning, speeded up the process, but to an extent which was not always statistically significant. The introduction of monetary rewards was a departure from the author's expressed desire to test the principle in an ordinary classroom situation.

3. "Learning in which the learner receives immediate knowledge of results . . . is less efficient than learning in which knowledge of results is delayed" (96). The differences were not always statistically significant, and the methods were probably not adequate to isolate the effects of delayed vs. immediate rewards.

DAEL L. WOLFLE
University of Chicago

JONES, VERNON. *Character and Citizenship Training in the Public School: An Experimental Study of Three Specific Methods* (Chicago: The University of Chicago Press, 1936), pp. xi + 404. $3.00.

This book describes a series of controlled experiments on the influence of three types of instruction on ethical judgment and behavior: (1) first-hand experiencing with no effort to get pupils to generalize from the experiencing; (2) discussion; and (3) a combination of experiencing and discussion, in which effort was made to have the pupils relate their specific experiences to general principles. The experiment extended over a school year and involved approximately 300 seventh- and eighth-grade pupils in eight classes. Initial and final measurements were taken on a variety of types of tests —mostly actual conduct tests—and also a delayed measure was taken. Experimental and control groups were roughly matched on five criteria. In a few of the intergroup comparisons the same teacher

taught both experimental and control groups, while in the other cases different teachers taught the compared groups. This latter is a very dangerous procedure in controlled experimentation, because teachers usually prove to make a greater difference in outcome than methods do; but in this experiment the danger was somewhat lessened by the fact that several different teachers participated on each side, so that their differing abilities and temperaments would perhaps balance up pretty well on the average.

On the whole, the experiment showed measurable superiority in gain on the part of the experience-discusison groups over both the control groups and the other two experimental groups, although the differences were not wholly consistent in the different types of measurement. Furthermore, the difference was at a minimum when the application field covered by the test was remote from the field of particular emphasis in the training. The advantage of the experience group or of the discussion group over the control was very small and inconsistent in the several comparisons, although there was some slight evidence of superior gain from these methods. The gains in character education were not achieved at the cost of social studies achievement, from which courses the needed time was chiefly taken; the social studies masteries were not significantly different between the experimental and the control groups. Dr. Jones comments upon the smallness of the gains in character education, even from the best of his instructional methods, in contrast with the extravagant hopes laymen entertain from moral instruction. Some previous investigators have commented upon this same phenomenon.

There is nothing particularly new in this presentation—in its research techniques, the measuring instruments employed, or the findings. The matching of groups and the control of experimental conditions are admittedly somewhat rough, but perhaps good enough for the purpose; a wide range of measurements were taken, a few of them by original tests but mostly by the well-known tests of Voelker, Maller, Hartshorne and May, and others; and the findings are in practically complete conformity with those of previous research on this theme. Nevertheless it was a useful service to publish the full account of this study in book form. The 82-page chapter describing instructional units is of value to educational practitioners. The book is sufficiently nontechnical in style, and sufficiently concrete in presentation, to be highly suggestive to teachers as to how to set up experimentation in this important field. And its summary of previous research on the effectiveness of different kinds of instruction to modify attitudes and conduct, clinched by the confirmation of this fairly large-scope experiment, supplies a mass of evidence easily sufficient to justify action in our instructional program. We now know, with little probability of reversal of the findings, that direct and systematic ethical instruction, especially when paralleled by guided experience, will normally affect practical conduct, although the gains from this factor alone will be small unless the instruction is followed through considerable periods of time. Conversely, we must expect little headway toward desired objectives from experience unaccompanied by discussion to shape its findings into generalizations, or from scattered incidental instruction, or from instruction not closely connected with the specific life applications about which we are concerned.

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California State Curriculum Commission. *Teachers' Guide to Child Development in the Intermediate Grades* (Sacramento: California State Department of Education, 1936), pp. xxviii + 631.

"California has no state curriculum or course of study. It is not the policy of the state to present in detail the content or teaching methods to be followed by individual schools within the state school system . . . The point of view set forth in the curriculum materials developed by the State Curriculum Commission and the State Department of Education represents an ideal toward which it is believed that local school systems should endeavor to work rather than a somewhat inflexible program which must be immediately put into practice."[1] These words from the foreword explain the function of this recent publication which has been prepared for the elementary teachers and supervisors of California.

The introductory chapters include a review of present trends in educational philosophy, suggestions on the organization for later elementary grades, an analysis of the functions of the teacher in a school that conforms with this newer philosophy of education, and a chapter on the books and materials required for effective learning.

The remaining chapters are devoted to various phases of the curriculum with one or more chapters on each of the following: social studies, sciences, reading, oral and written expression, arithmetic, music, art, and creative play. These chapters include discussions of principles and methods but consist in large measure of descriptions of activities and teaching aids. A series of eight chapters is devoted to detailed descriptions of large activity units in such broad fields as "Hawaii," "Mexico," "Life of the Sea and Shore," "The Colorado Desert," "Soap," and "Transportation."

The last 114 pages are devoted to a carefully selected and conveniently arranged bibliography of materials for the use of pupils and teachers in the development of curriculum units, and a graded and annotated list of books and materials for recreational reading.

A large percentage of the total number of pages in the book is devoted to lists of materials and to descriptions of procedures and units which have been used by various teachers and supervisors of the state. It is a miscellaneous collection representing the more progressive practices in the state but still contains illustrations of both the old and the new in educational practice. For that reason it will disappoint some who read it. Some teacher, for example, will be disappointed with the book because it places so much emphasis on the "activity" as a unit of learning, while others who believe in the activity approach will be concerned that the descriptions of activities sometimes disregard the possibilities of self-direction and creative effort on the part of the child. Other readers will be worried at times by the careless use of pedagogical terms and by the incomplete discussion of important matters. These are to be expected in such a book, and do not keep us from appreciating that which is good in it. Its value as a description of what teachers have done in the classroom, and as a source book to which one can turn for helpful suggestions and materials make it a valuable addition to literature in elementary education.

KENNETH L. HEATON

State of Michigan
Department of Public Instruction

MONROE, MARION, and OTHERS. *Remedial Reading: A Monograph on Character Education* (Cambridge: Houghton Mifflin Company, 1937), pp. xi + 171. $1.40.

The remedial reading program reported in this book was developed as part of an

[1] *Teacher's Guide to Child Development in the Intermediate Grades*, p. vii.

experiment in character education at Washington, D. C. Justification for including the remedial reading unit in the larger program is the obvious relationship between reading disability and personality maladjustment.

After a brief statement of the relationship between reading proficiency, personality and character, the general principles of diagnostic and remedial reading are outlined along the lines emphasized by Monroe in her earlier writings. Apparently this part of the discussion is meant to orient the reader rather than to serve as a manual of directions. Some readers will question the desirability of adding the photographing of eye movements to the other diagnostic aids.

In the remainder of the book is reported the programs and results of remedial reading in the elementary school, the junior high school, the senior high school, and a vocational school. After selecting the retarded readers on the basis of intelligence in relation to school achievement on standardized reading tests, the deficient pupils were given remedial instruction in small groups by the regular classroom teacher under supervision, or by trained counselors. The individual rather than the group, however, was the keynote of the remedial work. Training continued for 12 to 21 weeks, meeting 3 to 5 times per week. The median gain in reading achievement was 0.8 year. About 20 percent were brought up to the standard for their grade placement. Only 4 to 5 percent showed no improvement during the training period.

This group of experiments demonstrates clearly that a remedial reading program, in which regular classroom teachers and school counselors do the teaching under supervision, can be successful. Other school systems will undoubtedly be encouraged by these results to organize and carry out remedial programs of their own. Such programs should, of course, be made a continuing part of the school curriculum.

All educators interested in improving the reading status in their schools will give this little book a hearty welcome.

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University of Minnesota

GASKILL, HAROLD V. *Personality* (New York: Prentice Hall, Inc., 1936), pp. vii + 52. $.50.

The never ceasing attempt to evaluate human qualities by quantitative procedures has resulted in extensive studies and discussions of personality. The volume under consideration purports to "analyze . . . personality on a factual, scientific basis." Although no original data are presented, the author strives "to base the content on experimental results." The scientific approach to the problem is quite commendable.

Intelligence, social adjustment, characteristics of overt behavior, and physical characteristics are listed as the personality variables. It is made clear that such pseudo-sciences as phrenology, physiognomy, graphology, and astrology, have little significance for personality evaluation. Endocrinology as related to personality is viewed so skeptically by the author that he seems to imply that it should be classed with the pseudo-ologies.

There is a wholesome emphasis on the modifiability of personality. The reader is warned that he can expect little help from "charm-school courses . . . in six easy lessons." It is suggested that better personal adjustment can be brought about by knowing one's self, facing facts, and acting upon just criticism.

It is difficult to understand how a treatise based upon experimental evidence

could accept the theory of compensation in development implied in the following statement: "But if they are low in one group of characteristics, they are quite likely to be *exceedingly high* in other groups." (p. 7) It is also vague and unscientific to say, "*Certain* aspects of behavior or *certain* qualities of the individual have been singled out and stressed by *some* writers as being all-important in personality" (p. 7) The reader asks: "What aspects?" "What qualities?" "Which writers?" To assume that "almost one hundred percent of the clerk's time is spent in talking with other people" (p. 26) shows very little insight into the duties required of retail salesmen.

The discussion is clear, simple, and condensed; in fact so condensed that one feels the lack of force and significance in the presentation. The treatise may serve as a starting point in an orientation course for which it was apparently intended.

CHARLES D. FLORY
Lawrence College

COBB, STANLEY. *Preface to Nervous Disease* (Baltimore: William Wood and Company, 1936), pp. vii + 173. $3.00.

The author of this book is too well known as neuropsychiatrist to require discussion by a reviewer of one of his books. As with many of his other writings, this book represents a straight-forward, simple, yet scholarly, discussion of the problems he undertakes to present to the reader. The material on the anatomy and pathology of the nervous system is presented in such a way that it can be read with great profit not only by the beginning student, but also by the physician of long experience. Only two chapters deal with functional or psychological problems. Both of these chapters are definitely less scholarly than the chapters which discuss the organic problems. In the first of these chapters the author discussed the mind-body problem which is a subject that has for a long time been discarded as a topic for serious discussion by psychologists. The author attempts to impress the reader with a scientific attitude towards the conscious and the unconscious. In the last chapter of the book the author discusses epilepsy and mental disorder. In regard to psychopathology, the author unfortunately mentions the theories of only one psychiatrist, those of Adolf Meyer. In this chapter the topics of personality, functional mental disorders, and anti-social behavior are touched upon briefly. Although it is quite obvious that the organic material is presented thoroughly and yet briefly, it is also obvious that the functional mental disorders and personality problems cannot be presented in such a brief fashion, principally because so little is known about these topics.

Students of psychology will find this book of real value in coördinating their attitudes and knowledge regarding organic central nervous system problems. The material is well organized and the topics are well chosen with the exception of some of the psychological material.

MANDEL SHERMAN
University of Chicago

ORTON, SAMUEL TORREY. *Reading, Writing and Speech Problems in Children: A Presentation of Certain Types of Disorders in the Development of the Language Faculty* (New York: W. W. Norton & Company, 1937), pp. vii + 215. $2.00.

The first serious work in diagnostic and remedial reading was done by medical men at the turn of the century. Gradually this type of work was taken over

by psychologists and educationalists. In this book, we again get a stimulating physiological approach to reading deficiencies from one whose background is medicine. The author summarizes his clinical and research experiences accumulated during a ten-year period. Although the book deals with various language deficiencies, the major emphasis by far is upon reading disability.

The author's classification of language disabilities is patterned after that employed for the language disorders of adults following lesion in *one* hemisphere of the brain. In children, language facility is held to be intimately related to the degree of cerebral dominance manifested in the control of language behavior. The term "developmental" is applied to all these language disabilities in order to include both heredity tendencies and environmental forces that are operating.

Visual defects were no more severe among the non-readers examined than among normal readers. Although this is contrary to some recent reports, it confirms others. Many individuals are beginning to feel that undue emphasis has been given to the possible influence of physical defects upon reading proficiency.

Reading disability is considered to be largely a disorder of memory,—a failure to repicture the exact order of the constituent letters in attempting to recognize or recall a word. Consequently, there is a poor blending of successive sounds in the word. Lack of strictly unilateral cerebral control of language functions cause these confusions in recognition and recall according to the author.

The remedial treatment advised is sound. Points of strong emphasis are phonetics, and kinaesthetic training. Satisfactory progress is ordinarily achieved only by individual teaching.

Here is a very stimulating book, one that should be carefully examined by all interested in reading disabilities. The physiological emphasis is refreshing. Although many will reserve judgment on the theories proposed, all will recognize the adequate analysis of reading behavior and the sound remedial techniques used.

The short sections on stuttering, developmental word deafness, developmental apraxia, etc., however, are inadequate because of brevity, or are of doubtful value because little is yet known about such behavior.

MILES A. TINKER
University of Minnesota

NEWMAN, HORATIO H., FREEMAN, FRANK N., and HOLZINGER, KARL J. *Twins: A Study of Heredity and Environment* (Chicago: The University of Chicago Press, 1937), pp. xvi + 369. $4.00.

In *Twins* three well known authorities, a biologist, a psychologist and a statistician, have combined to produce, over a ten-year period, a most substantial and timely monograph on the perennial question of the relative influence of heredity and environment.

The authors accept from the outset the theory that there are two types of twins, monozygotic or identical, which are developed from the single egg, and dizygotic or fraternal, developed from two eggs. In the first instance the heredity is certainly the same; while in the second, from a strictly genetic viewpoint, the relationship is no closer than that between ordinary siblings. In the case of identical twins, the authors postulate differences which may be ascribed to differential prenatal nourishment and perhaps to the mechanism of asymmetry associated with the twinning process. These postulates, however, need not be considered essential to the authors' main observations and discoveries.

One of the many strong points in this study is the careful work done to dis-

criminate between identical and nonidentical twins. Ten criteria were established, and measurements and observations were carefully taken. They related to such items as hair—, eye—, and skin color, facial and dental features, characteristics of hands and fingers, and closeness of cross resemblances between twins. Yet as one reads through the monograph, the impression is gained that all these criteria may be summed up in item number one which they formulate as follows: "(To be classed as monozygotic or identical) twins must be so strikingly similar in general appearance that they are likely to be mistaken one for the other." This impression comes largely through the utilization of pictures and the recording of notes on the general similarity of twins who have been reared apart. In this sense the more refined measurements referred to above are primarily technical corroborations. They are decisive in those cases in which the criterion of general physical similarity is doubtful.

The authors establish once and for all that identical twins reared together may differ markedly in various traits. But they point out that not all such variation can be ascribed to postnatal environmental influences. They hold, with sound reasoning, to the likelihood that some differences are associated with neither strict heredity nor strict environment. For example, if the factors mentioned above (fetal blood supply and asymmetry in the embryonic stages) are to be placed within the category of environment, there is need for a rigorous definition of this term.

With respect to the factor of asymmetry, the authors attempt to face the problem of the excess left-handedness among identical and fraternal twins as compared to the general population of siblings. However, this question remains a mystery.

The authors present elaborate data on fifty pairs of identical twins reared together versus fifty pairs of fraternal twins reared together. All these twins were of the same sex in each pair. The age range was from eight to eighteen years. They also present similar data on nineteen pairs of identical twins reared apart. In the latter case the method of discovery through correspondence, observations of similarities by friends, advertising, and prize awarding led to a selection of identical twins of high physical similarity. Should there be such a phenomenon as identical twins not much alike in general appearance they would not be discovered by this method. However, this prerequisite of physical similarity in the identical twins who were reared apart does not carry over to other than physical traits, since observers would not think of relating mental, educational or occupational similarities to biological kinship.

Comparing identical and fraternal twins, the authors demonstrate that there is a slight tendency on the part of identical twins to become less alike in mental and educational achievement as they grow up; while for fraternal twins these conditions are more significant.

The master stroke in this whole investigation was the discovery, through great efforts, of nineteen pairs of identical twins who had been reared separately over a long period of years. With skill and patience these rare birds were induced to visit Chicago, two by two, for thorough examination and measurement. All these twins had been separated in early childhood (the time of separation was at ages two weeks to six years, but chiefly in the first year), and they had remained separated for the most part up to the time of their examination. It is true that in some cases they had seen something of each other or had corre-

sponded, but it is unlikely that any substantial influences could have been thus mediated.

Emerging from this highly valuable set of materials is a little table of correlations (page 340) entitled "Correlations of Twin Differences on Certain Traits with Estimated Differences in Three Environmental Ratings." Environmental ratings on educational, social and physical influences were prepared on the basis of the estimates of five judges. Among the significant correlations are the following:

Weight with physical environment	r = .60
Binet I.Q. and	
Educational environment	r = .79
Social environment	r = .51
International Test and	
Educational environment	r = .46
Social environment	r = .53
Stanford Educational Age with educational environment	r = .91

Certainly until further evidence of this crucial nature is assembled we shall have to accept the finding that "differences in educational and social environment produce undeniable differences in intelligence and scholastic achievement as measured by our tests." Since the nineteen pairs of twins, on which these correlations are based, comprise "very nearly the entire available population of such cases within a thousand miles of Chicago," we are not likely to find any sudden piling up of other evidence. According to these data about 72 percent of all the Binet I.Q. differences between these pairs of identical twins reared apart is attributable to the educational and social differences which have been operating upon these twins through a long period of years. In another comparison the authors point out that for the identical twins reared apart fundamental physical characteristics such as standing height, sitting height, head length and head width correlate, as between pairs, just as highly as they do for identical twins reared together. In such comparisons correlations between fraternal twins are lower. But in the case of Binet mental age and Binet I.Q. the correlations between the individuals in an identical pair living apart are much lower than for identical twins living together; and, in the case of Binet mental age, are lower than for fraternal twins living together.

In short, differential environment affects what one should expect it to affect, namely, intelligence and educational achievement, rather than basic bodily proportions. In the words of the authors, "The environmental factor, operating alone in the case of separate identical twins, can produce differences as great as or greater than those produced when both hereditary and environmental factors operate within twin families, as in the case of fraternal twins."

This book will repay close reading by students of biology, psychology, sociology and education. Its original materials are well integrated and beautifully presented from the standpoint of typography. Nor does it lose itself in the midst of statistical or other technicalities. A good balance is maintained, and the portion devoted to case studies contains much of general human interest. One can even amuse himself by following the case of the remarkable dog Trixie, who existed in duplicate in the homes of identical twins who had been separated from infancy.

No further work on twins should neglect this study, and no person can consider himself adequately informed on the whole question of heredity and environment without some knowledge of this work.

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RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

BUROS, OSCAR K. *Educational, Psychological and Personality Tests of 1936,* Studies in Education, No. 11 (New Brunswick, New Jersey: School of Education, Rutgers University, August, 1937), 141 pp.

A bulletin listing the educational psychological and personality tests for 1936 and includes a bibliography and book review digest of measurement books and monographs for 1933-36.

COOK, KATHERINE M. *Review of Conditions and Developments in Education in Rural and Other Sparsely Settled Areas,* Being Chapter V of Volume 1 of the Biennial Survey of Education in the United States: 1934-36, No. 2 (Washington: Office of Education, United States Department of the Interior, 1937), 70 pp.

This bulletin is a summary of the school situation in rural and sparsely settled areas at or about the present time as indicated by statistics for 1934. Data are included for the years 1926 and 1930.

DALE, EDGAR, and RAMSEYER, LLOYD L. *Teaching with Motion Pictures:* A Handbook of Administrative Practice, American Council on Education Studies (Washington: The American Council on Education, 744 Jackson Place, April, 1937), 59 pp.

This study deals with problems related to the use of the motion picture in the classroom and is intended to develop a feeling of adequacy on the part of the in-service teacher and administrator in the use of the motion picture as a medium of instruction.

GRAHAM, BEN G. (Chairman) and OTHERS. *The Motion Picture in Education: Its Status and Its Needs,* American Council on Education Studies (Washington: The American Council on Education, 744 Jackson Place, April, 1937), 24 pp.

This is a report of the development of the educational motion picture project by the Committee on Motion Pictures in Education. The present status of films in education, the distribution of film materials and the immediate problems with suggested approaches are discussed at length.

HILL, THOMAS B., and VERCO, D. J. A., (Editor). *The Education of the Mentally Handicapped Children,* Educational Research Series, No. 47 (Melbourne, Australia: Melbourne University Press, Carlton, N. 3, 1937), 104 pp.

Data dealing with many aspects of this problem were gathered through questionnare method from most of the important countries of the world. This is a report of that survey and brings together comparative information regarding the provision of the organized schemes, methods of selection, training of teachers,

effectiveness of instruction, and the curriculum. Bibliography.

MARTINS, ELSIE H., and REYNOLDS, FLORENCE E. *An Annotated Bibliography on the Education and Psychology of Exceptional Children*, No. 71 (Washington: Office of Education, United States Department of the Interior, 1937), 41 pp.

This is the third bibliography dealing with exceptional children which has been issued by the Office of Education and gives references of general nature dealing with several or all types of exceptional children and the administration of special education as a whole. There are eight sections, one each devoted to the consideration of a major group of exceptional children.

EDUCATIONAL ADMINISTRATION

ELIASSEN, R. H. "Pre-Training Selection of Teachers During 1934-36," *Educational Administration and Supervision*, XXIII (May, 1937), pp. 367-376.

The author summarizes the most significant conclusions of the forty selected studies which are listed in the bibliography.

HERBST, R. L. "Can Success in High School be Predicted at the End of Grade IX? *The School Review*, XLV (September, 1937), pp. 508-515.

From a study of 1,334 pupils in 27 schools the author found that it is difficult to predict with any great degree of accuracy the educational standing of pupils four years after they enter grade IX.

HUGHES, J. M., and HERRON, HARRY H. "Scheduling Practices in Four-Year High Schools," *The School Review*, XLV (September, 1937), pp. 516-524.

Survey of the scheduling practices of 703 four-year standard high schools as furnished on a questionnaire. Discussion centers around annual schedule of events, daily record of events, the study hall, assemblies and home room.

STUDIES OF TEACHING, LEARNING, AND SUPERVISION

EDMISTON, R. W. "The Effects of Emphasizing 'How to Learn' Upon Knowledge of Course Content and School Marks," *The Journal of Educational Psychology*, XXVIII (May, 1937), pp. 371-381.

Using the equated group technique the author attempted to determine whether or not an emphasis upon how-to-learn would effect the learning within the course where applied and in other school work. Improvement is more noticeable in the school marks of students given instruction in how to study than in marks of students without this instruction. This improvement does not continue after instruction in how to study has ceased, but there is little indication of reversal to old habits.

SCHLOSBERG, HAROLD. "The Relationship Between Success and the Laws of Conditioning," *Psychological Review*, XLIV (September, 1937), pp. 379-394.

The purpose of this article is to differentiate between learning involving simple conditioning and learning involving the law of effect. The author suggests that both types of learning do not receive the name of "conditioning" since the methods seem markedly different.

WITTY, PAUL, and KOPEL, DAVID. "The Place of Phonetics in a Reading Program," *Educational Administration and Supervision*, XXIII (May, 1937), pp.321-334.

The authors discuss the historical development of phonetics, trends in phonics instruction, effects of phonics, phonics in remedial reading and conclude that there is little agreement in the literature. They urge that the method used be adapted to the individual.

GROSSNICKLE, FOSTER E. "An Experiment with Two Methods of Estimation of the Quotient," *The Elementary School Journal*, XXXVII (May, 1937), pp. 668-677.

The author presents the results of an experimental study of the "apparent method" and the "increase by one" method of estimation of the quotient in which he finds that neither is superior to the other.

ROSANDER, A. C. "An Experimental Course in Quantitative Thinking," *The School Review*, XLV (May, 1937), pp. 337-346.

The author describes the purpose, plan, and organization of an experimental course in "Social Mathematics" offered in the senior high school at Bronxville, New York during the semester ending June, 1936.

TATE, HARRY L. "The Influence of Phonics on Silent Reading in Grade I," *The Elementary School Journal*, XXXVII (June, 1937), pp. 752-764.

The author presents the purpose, plan and experimental results of an experiment to determine the influence of phonics on silent reading. The author finds merits in both phonic instruction and the "look-and say" method but infers that regular peroids for phonics are not desirable, that phonics should be used as a tool and that over-emphasis on phonics hinders rapidity and thoroughness of comprehension.

CURRICULUM CONSTRUCTION

DEBOER, JOHN J. "The Determination of Children's Interests in Radio Drama," *The Journal of Applied Psychology*, XXI (August, 1937), pp. 456-463.

The author presents results of a series of experiments and believes that by observing and recording the children's physical reactions to radio programs is useful in discriminating between passages of low and high interest value when the number of cases is large.

FEINGOLD, GUSTAVE A. "Adjusting the Curriculum to Mental Capacity," *Educational Administration and Supervision*, XXIII (May, 1937), pp. 354-366.

Conclusions reached after studying the difficulty among various subjects and between successive stages of high-school subjects the author concludes that pupils of I. Q.'s of one hundred five and above can do fifty to one hundred percent more work than those with I. Q.'s of one hundred and less and that the great variation in the percentage failing in the same subject from year to year, or at different stages in a given subject indicates a lack of scientific method in examining educational achievement.

SIMMONS, MAITLAND P. "Changing Conceptions of Topics Illustrations in General Science Textbooks," *The Journal of Experimental Education*, V (June, 1937), pp. 368-372.

From an analysis of 18 general science textbooks covering a period of years, 1911-1934, the author presents data relative to the occurrence of pictures pertaining to the topic, air.

CHILD WELFARE, GUIDANCE AND DEVELOPMENT

ANDERSON, HAROLD H. "An Experimental Study of Dominative and Integrative Behavior in Children of Pre-School Age," *The Journal of Social Psychology*, VIII (August, 1937), pp. 335-345.

A group of normal and superior children in an experimental nursery school were found to be significantly less dominative than a group of orphanage children in nursery school. The group of orphanage nursery school children were significantly more dominating than a control group of non-nursery school children of the same chronological and mental ages in the same orphanage. Dominative and integrative behavior as measured here, do not correlate with each other. Dominative behavior shows no correlation with chronological age, mental age, *I. Q.*, change in *I. Q.*, attendance at nursery school, or length of time at the orphanage.

FENTON, NORMAN, and WALLACE, RAMONA. "Child Guidance in California Communities: A Statistical Study of 1660 Cases Referred to the California Bureau of Juvenile Research," *The Journal of Juvenile Research*, XXI (July, 1937), pp. 125-179.

The 1660 cases referred to the Bureau of Juvenile Research were studied on the basis of the type of problem; relation of intelligence quotient, chronological and mental age, sex, school grade and economic background to the type of problem presented.

HARDY, MARTHA CRUMPTON. "Social Recognition at the Elementary School Age," *The Journal of Social Psychology*, VIII (August, 1937), pp. 365-384.

The data presented in this article were collected as part of an extensive investigation on problems of growth and development in Joliet, Illinois, and are concerned with a representative sample of the school population. Factors considered in studying child behavior were social recognition as judged by teachers and by pupil preferences; behavior traits and school attitudes; intelligence and school accomplishment; physical achievement; health conditions; physical appearance; and home situations. In general the study tends to show that the children whom other children esteem highly are superior to the average individual in the group.

BESCH, EMIL M. "Occupations of Graduates of a Small High School," *The School Review*, XLV (June, 1937), pp. 447-451.

The author presents the results of a follow-up study of the graduates of a small country high school where a large percentage of the cases go into occupations of a higher vocational order than their fathers.

FRIEDMAN, KOPPLE C., and JACOBSEN, P. B. "A Statistical Basis for Educational Guidance," *The School Review*, XLV (May, 1937), pp. 358-363.

The authors present a survey of the number of subject failures for pupils in the Hibbing Junior College who graduated, and for those who dropped out of school during the period from 1931-32 to 1935-36; (2) an inquiry into the progress of Hibbing High School graduates.

MASLOW, A. H. "Dominance-Feeling, Behavior and Status," *Psychological Review*, XLIV (September, 1937), pp. 404-429.

The author discusses the relationship between dominance-feeling and dominance

status, dominance behavior, matter-of-fact superiority and inferiority, the craving for dominance, the role of dominance in the total personality and the relationship between culture, personality and dominance.

EDUCATIONAL MEASUREMENTS, STATISTICS, AND SCIENTIFIC TECHNIQUES

ALSTETTER, M. L. "Scales for the Evaluation of the Training of Teachers," *The School Review*, XLV (September, 1937), pp. 529-539.

A report of the Coöperative Study of Secondary School Standards explaining the derivation of scales for measuring three aspects of the training of teachers: its adequacy, its comprehensiveness, and its recency.

ARTHUR, GRACE. "The Predictive Value of the Kuhlmann-Binet Scale for a Partially Americanized School Population," *The Journal of Applied Psychology*, XXI (August, 1937), pp. 359-364.

From the data presented it appears that an examination with the Kuhlmann Revision of the Binet-Simon scale given to a Kindergarten, Grade 1 or 2 child from a non-English speaking home can yield reliable results.

BAXTER, EDNA DOROTHY. "The Baxter Child Personality Test," *The Journal of Applied Psychology*, XXI (August, 1937), pp. 410-430.

The Baxter Child Personality Test, which is designed for testing children from the ages of 4 to 13 years, inclusive, is discussed in relation to: distinctive characteristics and description; history and construction; scoring; standardization and statistical treatment; and interpretation.

SCATES, DOUGLAS E. "The Essential Conditions of Measurement," *Psychometrika*, II (March, 1937), pp. 27-34.

The author presents three conditions and characteristics of measurement which are basic; namely: a working concept of the character to be measured, a satisfactory representation of the character to be measured and third, a basis of quantitative comparison.

MISCELLANEOUS

GLANVILLE, A. DOUGLAS, and KREEZER, GEORGE. "The Characteristics of Gait of Normal Male Adults," *Journal of Experimental Psychology*, XXI (September, 1937), pp. 277-301.

The aim of this study was to determine the characteristic of gait of a sample group of normal male adults by means of a method for analysis recently described by the authors. The properties of gait investigated were those relating: to temporal-spatial pattern of foot-contacts; to changes in position of particular body-parts, measured in degrees; and to over-all properties of gait relating to the walking activity as a whole.

NEW TESTS

FRANZEN, RAYMOND, DERRYBERRY, MATHEW, and MCCALL, WILLIAM A. *Health Awareness Test*. New York: Bureau of Publications, Teachers College, Columbia University, 1937.

This test is designed as a measure of achievement and may be used for diagnostic purposes in the fifth and sixth grades. The validity and reliability are indicated in the manual of directions.

HILDRETH, GERTRUDE H., and PINTNER, RUDOLF. *Manual of Directions for Pintner-Patterson Performance Tests Short Scale* (New York: Bureau of Publications, Teachers College, Columbia University, 1937), 16 pp.

A manual describing the purpose, content and interpretation of the Pintner-Patterson Performance Tests Short Scale.

MORT, PAUL R., and CORNELL, FRANCIS G. *A Guide for Self-Appraisal of School Systems* (New York: Bureau of Publications, Teachers College, Columbia University, 1937), 66 pp.

This instrument is designed to serve as a basis for the appraisal of the individual school systems with respect to their adaptation to current educational needs. There are four major divisions: Classroom Instruction, Special Services for Individual Pupils, Educational Leadership, and Physical Facilities and Business Management; and twenty-three subsections. Tentative standards are given.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Ohio State Projects.—The Educational Research Bulletin for October 16, 1936, outlines the work of the various divisions of the Bureau of Educational Research, Ohio State University: Accomplishment Tests, Appointments, Curriculum, Editorial, Personnel, Radio, Reference, High-School and College Relations, and Survey. The Division of Tests and Measurements has become the national center for the evaluation program of the Progressive Education Association Eight-year Program, with funds provided by the General Education Board. The new Division of High-School and College Relations is directing that work for the same Association, with funds provided by the Carnegie Corporation. The director of the Bureau is W. W. Charters.

Pennsylvania Research Association.—The Pennsylvania Educational Research Association adopted in December, 1936, a constitution which states the purpose of the organization as follows: The Association shall stimulate interest in educational research through publications and meetings; encourage individual research; and coöperate with other organizations in new research projects and in the summarization and dissemination of the results of previous researches. Membership is restricted to those who are able to furnish satisfactory evidence to the Executive Committee of accomplished research and a disposition to continue to devote time to such activities.

Coördination in Texas.—The Texas Commission on Coördination in Education has been organized to assist schools and colleges in dealing with problems of individual differences. It is sponsored by the Association of Texas Colleges, and represents elementary, secondary, and higher education. The Texas State Department of Education and the American Council on Education are coöperating in its program.

The Commission is now conducting a state-wide testing program in elementary, secondary, and higher schools. It believes that through this program it can make an important contribution to individualization and guidance. It encourages the use of a wide variety of tests at every level, but recommends that a certain minimum list be given by all schools at specified levels. This list will change from year to year. Each school participating in this coöperative program purchases and gives its own tests, uses the results as it wishes in the solution of its own problems, and in addition furnishes a copy of the results on prepared forms for tabulation and study by the director of research. These tabulations and various interpretations based upon them are then reported back to the coöperating schools. This project is not a scholarship contest. It has nothing to do with accrediting or approving particular schools. It is not an attempt to discover the efficiency of individual teachers. It is an honest effort to assist schools and colleges, and ulti-

mately, of course, the pupils and students who attend them. The director of research is H. T. Manuel of the University of Texas. The Commission has printed a number of research bulletins dealing with its program of work.

Teaching of Fractions.—A coöperative study of the teaching of fractions has been conducted by G. M. Wilson of Boston University. The major conclusions are as follows: (1) The grade placement for mastery of fractions is sixth grade. (2) The work on fractions should be distributed through the sixth year as the new drill work for the year. (3) Useful fractions only should be stressed, if properly handled. (4) The best results of the study suggest that all work on fractions should be objective, with no manipulative work. (5) The individual teacher is a dominant factor in determining results and attitudes. The chief difficulty with our work in fractions is that it has consisted of meaningless manipulations. The first step is to confine work to the fractions of adult range and as used by adults. This will eliminate the need for manipulation. Children at the sixth grade level can do the objective thinking for useful fractions,—halves, fourths, thirds, eighths, and twelfths, with no crossing of denominators except halves, fourths, and eighths. The child is entitled to understanding and success. This can be provided without loss, with much ultimate gain in understanding and confidence. At present, all work is too lacking in meaning, although an occasional teacher gets the idea. We must begin with ourselves for a better viewpoint, and then carry this viewpoint to the children. Useful fractions can be taught for perfect mastery.

Speyer School Studies (New York).—Research projects under way in December, 1936, at Public School 500, Speyer school, New York City, exclusive of those being done by WPA workers, are as follows:

1. The construction of a suitable curriculum for pupils who test above 130 I.Q. (Stanford-Binet). This is a five-year project, subdivided into a larger number of subsidiary, coördinated projects. The work is being done, under the supervision of Leta S. Hollingworth, by the following persons: Myrna I. Schuck, Kathryn G. Clarke, Samuel Robinson, and others.

2. Comparative study of materials for the teaching of nutrition to pupils of I.Q. 75-90 and of I.Q. above 130, respectively. This work involves a five-year project, and is being done under the supervision of Mary S. Rose.

3. Comparative intelligence of the siblings of children testing above 130 I.Q. (Stanford-Binet) and of children testing between 75 and 90 I.Q. (Stanford-Binet). This study includes 100 percent of living siblings of both groups, in Public School 500, and is being done by Leta S. Hollingworth and Kathryn Horan.

4. A study of imaginary playmates, by Rachel Mac K. Simmons, under the supervision of Leta S. Hollingworth.

5. The psychology of personal preference, as shown by children above 130 I.Q. (Stanford-Binet), by Leta S. Hollingworth, as a phase of a five-year study of the social psychology of intelligent children.

6. A comparison of young children who are slow learners with those who are quick learners, by means of non-verbal performance tests. This involves 100 children, tested by the Pintner-Paterson scale and by Stanford-Binet, being carried out by Donald MacMurray, as part of a plan to revise and improve "performance" tests in relation to deviates.

7. A study of the hands of gifted children in comparison with the hands of

dull-normal children. This involves 100 children, 7-9 years old. Dimension, shape, and function of the hand will be studied. This is being done by James M. Dunlap and Leta S. Hollingworth in collaboration.

New York Research Association.—The Educational Research Association of New York State held its Eighth Annual Meeting, December 28, 1936, in Syracuse, in conjunction with the holiday meeting of the Associated Academic Principals of New York State. The program centered around two of the major research activities now under way in the state: (1) the Regents Inquiry into the cost and character of education and (2) the enlarged administrative unit. J. Wayne Wrightstone represented the staff of the Regents Inquiry and spoke on the methods and technique used in this study. Five speakers discussed the enlarged administrative unit—its purpose, organization, and problems.

Officers of the Association elected for the ensuing year are: President, A. L. Maxon, Director of Research, Schenectady Public Schools; Vice-President, E. N. Ferriss, Cornell University; Secretary-Treasurer, Wayne W. Soper, State Education Department; and Director, O. E. Hertzberg, State Teachers College, Buffalo.

Ohio List of Serials.—A Regional List of Serials in the College and University Libraries in Ohio has been compiled by a committee of the College and University Section of the Ohio Library Association. (Ohio Library Association, Edward A. Henry, Treasurer, University of Cincinnati, 1936. 205 pp. $4.00.) This list represents the periodicals and serials to be found in twenty-five college libraries in Ohio whose holdings were not recorded in the *Union List of Serials* published by the H. W. Wilson Company. Since the majority of these colleges are denominational ones whose growth has been a slow process during the years, the record of their holdings includes almost two hundred and fifty titles not found in the *Union List of Serials*. As might be expected, a great part of these added titles are periodicals of sectional or denominational interest, the very ones it is often most difficult to locate.

Nebraska Studies.—The Nebraska State Teachers' Association under the direction of Charles A. Bowers, Executive Secretary, established a Department of Research as a part of its headquarters' organization in April, 1936, with Galen Saylor as Director of Research. The Department was instituted to serve the following purposes: (1) make research studies of some of the outstanding problems of the teaching profession in Nebraska; (2) make research studies of significant problems facing the public schools of Nebraska; (3) assist the various committees of the Educational Planning Commission of the Association in studying their problems and in carrying on their activities; (4) prepare teaching materials and teaching aids of value to the teachers of the state; and (5) promote teacher welfare.

In keeping with these purposes the Department has issued three types of publications since April, 1936. A series classified as Educational Bulletins contains the strictly research studies of the department. The five bulletins issued in this series to date are: No. 1, *The Elementary Report Card;* No. 2, *Trends in Salaries, Program, and Personnel of Nebraska Schools;* No. 3, *High School Report Card;* No. 4, *Salaries of Teachers, Length of Term, and Financial Condition of Nebraska Rural Schools;* and No. 5, *The Financial Support of Government in Nebraska—the Need for Study and Reform.*

Another series of publications is listed as Teachers' Pamphlets. This group includes the teaching aids and materials issued by the department and also studies of interest to the classroom teacher. The titles of the five pamphlets issued to date are: No. 1, *List of Selected Professional Magazines and Books;* No. 2, *The Unicameral Legislature: A Suggested Unit of Study;* No. 3, *Teaching the Controversial Issues: A Teaching Demonstration;* No. 4, *Social Security Legislation: A Suggested Unit of Study;* and No. 5, *Teacher Credit Unions.* One copy of each of the Educational Bulletins and the Teachers' Pamphlets is sent free to each school system in the state.

The third series of regular publications of the department is a compact four-page monthly news bulletin entitled, *The N.S.T.A. Bulletin.* These bulletins are sent free to each teacher in the state and contain brief articles on various professional problems and activities. The first issue of the Bulletin appeared in August and contained articles on professional relations and organizations. The September number dealt with professional ethics and teachers' conventions. The October issue discussed the legislative program of the Association and the November one the problem of school support in Nebraska. The January number discussed teacher retirement and outlined the salient features of the retirement bill to be sponsored by the Association before the legislature this year.

In addition to these activities, the Department has assisted several committees of the Association in studying specific professional and educational problems. At the present time, legislation is to the fore, and the legislative committee has a five-point program to present to the legislature. The Research department has assisted in the preparation of the bills and in gathering substantiating data for the measures.

This information was provided by Galen Saylor, Director of Research.

Research Helpful to Superintendents.—There are many fields in which research work might be done by a State Department of Public Instruction. Any information that can be received from groups of workers in the various school districts throughout a State in regard to the relative value of different types of information will aid in determining where the emphasis of the research work of a Department may best be placed. The purpose of this study was to obtain information from the county and district superintendents in Pennsylvania showing the fields in which information revealed through research would be most helpful to them and to use the findings as a partial basis for the formulation of a program of research for the Department of Public Instruction in Pennsylvania.

The following items were submitted in a questionnaire sent to all the school superintendents of Pennsylvania to obtain their reactions with respect to the types of information revealed through research that would help them most. What general type of information would be most helpful to you? (Place figures 1, 2, 3, etc., after each item below to indicate rank of your choice.)

1. Comparative cost and financial data
2. Statistical information pertaining to pupils
3. Statistical information pertaining to teachers
4. Current practices in curriculum construction
5. Current practices in administration
6. Current practices in supervision
7. Techniques of instruction
8. Current practices in pupil control.

The questionnaire including the items

listed above, and a request for additional items to be listed, was submitted to each county and district in the state. Replies were received from 41 of the 66 county superintendents, and from 110 of the 176 district superintendents. These furnished information from 62.1 percent of the county superintendents, and 62.5 percent of the district superintendents.

The ranking of the eight general types of information by the superintendents gave a distribution which made it impossible to determine the exact relative placing of each item. It was, therefore, necessary to treat the values of the superintendents' rankings of the individual items to arrive at a composite weighted value and rank of each item of information by use of Hull's formula.[1] Table I shows the weighted value and the rank order of these different types of information.

TABLE I

THE RANKING OF EIGHT GENERAL TYPES OF INFORMATION BY COUNTY AND DISTRICT SUPERINTENDENTS ACCORDING TO THEIR RELATIVE IMPORTANCE TO SUPERINTENDENTS IN THEIR WORK

Types of Information	County Superintendents		District Superintendents		County and District Superintendents	
	Weighted[1] Value	Rank	Weighted[1] Value	Rank	Weighted[1] Value	Rank
Current Practices in Curriculum Construction	54.5	4	59.6	1	58.2	1
Current Practices in Administration	55.9	2	58.5	2	57.7	2
Current Practices in Supervision	59.0	1	56.4	4	57.1	3
Comparative Cost and Financial Data	55.7	3	56.5	3	56.3	4
Techniques of Instruction	49.9	5	51.5	5	51.1	5
Statistical Information Regarding Pupils	41.3	6	40.1	6	40.5	6
Statistical Information Regarding Teachers	32.9	8	39.4	7	37.4	7
Current Practices in Pupil Control	38.1	7	36.9	8	37.3	8

1. The superintendents of the State suggested that their greatest needs would be served by concentrating research work in the following fields:

a. Current practices in curriculum construction

b. Current practices in administration

c. Current practices in supervision

d. Comparative cost and financial data.

2. The weighted rank values of these four types of information differ very little from each other, the first being 58.2 and the fourth, 56.3, making a difference of only 1.9.

3. There is a rather sudden drop between the weighted values of the type of information ranked fourth and the one ranked fifth in the preceding table, this being a difference of 5.2. The difference between these two items is 2.7 times the total difference in the weighted values of the items ranked first and fourth.

4. "Current practices in curriculum construction" which is ranked first by district superintendents is ranked fourth by county superintendents.

5. "Current practices in supervision" is ranked first by county superintendents and fourth by district superintendents.

6. While county and district superintendents rank "current practices in curriculum construction" and "current practices in supervision" in reverse order, both groups are in common agreement as to the ranking of the four most important types of information.

7. A number of superintendents recommended research work in a comparative

[1] Garrett, Henry E. *Statistics in Psychology and Education* (New York: Longmans, Green and Co., 1926), pp. 113-15.

study of property assessments for the purpose of taxation.

This study was conducted by Donald P. Davis of the Pennsylvania Department of Public Instruction.

State Departments of Research.—State departments of public instruction set standards of education along various lines, and disseminate and interpret to the public different types of information. A comparison of the program of any department of public instruction with that of other states will assist to some extent in evaluation.

The purpose of the study here reported was to secure information from the state departments to show the extent of their progress in research, child accounting, and statistics. A questionnaire was sent to each state requesting information concerning such activities. Replies were received from 27 state departments of public instruction, which include 56.3 percent of all the states.

The findings concerning research activities are as follows:

1. Research divisions are maintained by 77.8 percent of the 27 states reporting.

2. The research division is an independent division without being charged without other responsibilities in 22.2 percent of these states.

3. Seven states include financial and statistical work along with research work; 2 states include such work as accounting, purchasing, and financial records.

4. Only 22.2 percent of these states publish any kind of a research bulletin.

5. Research bulletins are printed more frequently than once a year in only 7.4 percent of these states.

6. The chief source of data for research bulletins is the reports from school districts.

7. Only four of these state departments devote time to comprehensive and exhaustive studies; the others confine their efforts to short and less extensive studies.

8. The primary purpose of research in about half of these departments is to furnish information as a basis for the formulation of policy for the Department of Public Instruction, and in the other half, to interpret the schools to the public.

9. State departments of public instruction, with the exception of a few cases, are not doing extensive research work.

10. Research bulletins of these departments are confined very largely to a summarization of reports from school districts, with some interpretation.

11. The median number of research workers in these departments is 3.3.

12. Most of the workers in research are qualified to do such work.

The findings concerning activities in the areas of child accounting and statistics are as follows:

1. A report of pupil attendance is required from school districts in 96.2 percent of these states.

2. Very few state departments require a report of illegal absences.

3. Most of the items of information included in the attendance reports from school districts are tabulated and printed.

4. A summary report of enumeration or census of children of school age is required in 76.9 percent of these states.

5. Only 34.6 percent of these departments require any kind of a report of employment of minors.

6. A report of age-grade status is required in half of the states reporting.

7. Perfect attendance is given state recognition by only 23.1 percent of the departments.

8. An annual statistical report is required from school superintendents in all of these states, and the items of the

report are quite similar in the various states.

9. The annual financial report-form used is rather uniform with respect to the items included.

10. The departments of public instruction print a number of miscellaneous reports.

11. Most departments of public instruction apparently are not placing much emphasis on the enforcement of school attendance.

This information was forwarded by Donald P. Davis, Chief, Child Accounting and Research, Pennsylvania Department of Public Instruction.

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